



TECHNICAL MANUAL

Collection data

Manual No. '06·SRK-T·050

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WALL MOUNTED TYPE ROOM AIR-CONDITIONER (Split system, air to air heat pump type)

**SRK50HE-S1, SRK56HE-S1
SRK63HE-S1, SRK71HE-S1**

2. WALL MOUNTED TYPE ROOM AIR-CONDITIONER (Split system, air to air) heat pump type

2.2	SRK50HE-S1	
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2.2.1 GENERAL INFORMATION

(1) Specific features

The “MITSUBISHI HEAVY INDUSTRIES, LTD.” room air-conditioner: SRK series are of split and wall mounted type and the unit consists of indoor unit and outdoor unit with refrigerant precharged in factory. The indoor unit is composed of room air cooling or heating equipment with operation control switch and the outdoor unit is composed of condensing unit with compressor.

(a) Remote control flap

The flap can be automatically controlled by operating wireless remote controller.

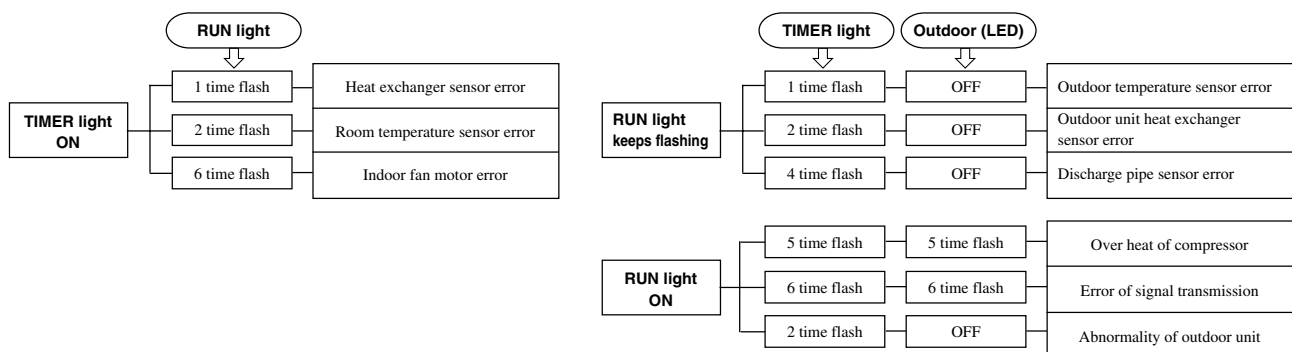
- Air scroll: Flap operation is automatically control.
- Swing: This will swing the flap up and down.
- Memory flap: Once the flap position is set, the unit memorizes the position and continues to operate at the same position from the next time.

(b) Automatic operation

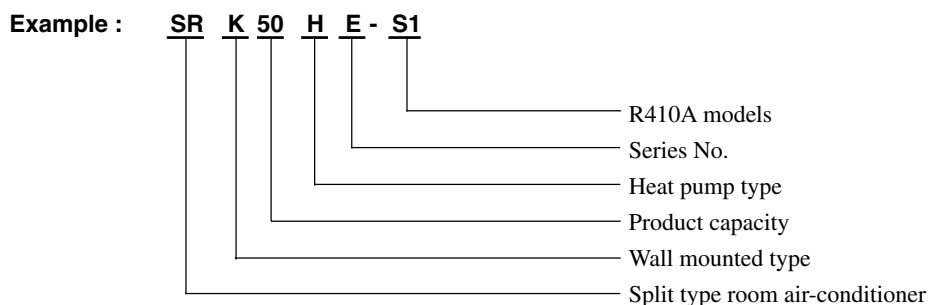
When the remote control switch is set on “auto(△)”, it will either automatically decide operation mode such as cooling, heating and thermal dry, or operate in the operation mode before it has been turned to automatic control.

(c) Self diagnosis function

- We are constantly trying to do better service to our customers by installing such judges that show abnormality of operation as follows.



(2) How to read the model name



2.2.2 SELECTION DATA

(1) Specifications

Model SRK50HE-S1 (Indoor unit)
SRC50HE-S1 (Outdoor unit)

(220/230/240V)

Item				Model	SRK50HE-S1	SRC50HE-S1
Cooling capacity ⁽¹⁾				W	4700	
Heating capacity ⁽¹⁾				W	5300	
Power source					1 Phase, 220-240V, 50Hz	
Operation data ⁽¹⁾	Cooling input			kW	1.41	
	Running current (Cooling)			A	6.5/6.3/6.0	
	Heating input			kW	1.40	
	Running current (Heating)			A	6.5/6.2/6.0	
	Inrush current			A	39.6	
	COP				Cooling: 3.33 Heating: 3.79	
	Noise level	Cooling	Sound level	dB	Hi 43, Me 39, Lo 34	47
			Power level		58	63
Heating		Sound level	Hi 44, Me 39, Lo 35		49	
		Power level	61		64	
Exterior dimensions Height × Width × Depth				mm	298 × 840 × 259	640 × 850 × 290
Color					Cool white	Stucco white
Net weight				kg	12	44
Refrigerant equipment Compressor type & Q'ty					—	RM-B5118MNE5 (Rotary type) × 1
Motor				kW	—	1.4
Starting method					—	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Straight fins & inner grooved tubing
Refrigerant control					Capillary tubes + Electronic expansion valve	
Refrigerant ⁽³⁾				kg	R410A 1.4 (Pre-Charged up to the piping length of 15m)	
Refrigerant oil				ℓ	0.7 (MA68)	
Deice control					Microcomputer control	
Air handling equipment Fan type & Q'ty					Tangential fan × 1	Propeller fan × 1
Motor				W	27	35
Air flow (at High)			(Cooling)	CMM	10.0	38.0
			(Heating)		12.5	38.0
Air filter, Q'ty					Polypropylene net (washable) × 2	—
Shock & vibration absorber					—	Cushion rubber (for compressor)
Electric heater					—	—
Operation control Operation switch					Wireless-Remote controller	—
Room temperature control					Microcomputer thermostat	—
Pilot lamp					RUN (Green), TIMER (Yellow), HI POWER (Green), ECONO (Orange)	
Safety equipment					Compressor: Overheat protection, Serial signal error protection, Indoor fan motor error protection, Frost protection	
Refrigerant piping	O.D			mm (in)	Liquid line: φ6.35 (1/4") Gas line: φ12.7 (1/2")	
	Connecting method				Flare Connection	
	Attached length of piping				Liquid line: 0.54 m Gas line : 0.47 m	—
	Insulation				Necessary (Both sides)	
Drain hose					Connectable	
Power source cord					2 m (3 cores with earth)	
Connection wiring		Size × Core number			1.5 mm ² × 4 cores (Including earth cable)	
		Connecting method			Terminal block (Screw fixing type)	
Accessories (included)					Mounting kit, Clean filter (Natural enzyme filter × 1, Photocatalytic washable deodorizing filter × 1)	
Optional parts					—	

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS C9612
Heating	20°C	—	7°C	6°C	ISO-T1, JIS C9612

The piping length is 7.5m.

(2) The operation data are applied to the 220/230/240V districts respectively.

(3) The refrigerant quantity to be charged includes the refrigerant in 15 m connecting piping.

(Purging is not required even for the short piping.)

If the piping length is longer, when it is 15 to 25 m, add 20 g refrigerant per meter.

Model SRK56HE-S1 (Indoor unit)
SRC56HE-S1 (Outdoor unit)

(220/230/240V)

Item				Model	SRK56HE-S1	SRC56HE-S1
Cooling capacity ⁽¹⁾				W	5100	
Heating capacity ⁽¹⁾				W	5800	
Power source					1 Phase, 220-240V, 50Hz	
Operation data ⁽¹⁾	Cooling input			kW	1.59	
	Running current (Cooling)			A	7.3/7.1/6.8	
	Heating input			kW	1.58	
	Running current (Heating)			A	7.4/7.1/6.8	
	Inrush current			A	45.2	
	COP				Cooling: 3.21 Heating: 3.67	
	Noise level	Cooling	Sound level	dB	Hi 44, Me 40, Lo 35	49
			Power level		59	64
		Heating	Sound level		Hi 44, Me 39, Lo 35	51
Power level			61		65	
Exterior dimensions Height × Width × Depth				mm	298 × 840 × 259	640 × 850 × 290
Color					Cool white	Stucco white
Net weight				kg	12	44
Refrigerant equipment Compressor type & Q'ty					–	RM-B5120MNE5 [Rotary type] × 1
Motor				kW	–	1.5
Starting method					–	Line starting
Heat exchanger					Louver fins & inner grooved tubing	Straight fins & inner grooved tubing
Refrigerant control					Capillary tubes + Electronic expansion valve	
Refrigerant ⁽³⁾				kg	R410A 1.4 (Pre-Charged up to the piping length of 15m)	
Refrigerant oil				ℓ	0.7 (MA68)	
Deice control					Microcomputer control	
Air handling equipment Fan type & Q'ty					Tangential fan × 1	Propeller fan × 1
Motor				W	27	35
Air flow (at High)			(Cooling)	CMM	11.0	38.0
			(Heating)		12.5	38.0
Air filter, Q'ty					Polypropylene net (washable) × 2	–
Shock & vibration absorber					–	Cushion rubber (for compressor)
Electric heater					–	–
Operation control Operation switch					Wireless-Remote controller	–
Room temperature control					Microcomputer thermostat	–
Pilot lamp					RUN (Green), TIMER (Yellow), HI POWER (Green), ECONO (Orange)	
Safety equipment					Compressor: Overheat protection, Serial signal error protection, Indoor fan motor error protection, Frost protection	
Refrigerant piping	O.D			mm (in)	Liquid line: φ6.35 (1/4") Gas line: φ12.7 (1/2")	
	Connecting method				Flare connection	
	Attached length of piping				Liquid line: 0.54 m Gas line : 0.47 m	–
	Insulation				Necessary (Both sides)	
Drain hose					Connectable	
Power source cord					2 m (3 cores with earth)	
Connection wiring	Size × Core number				1.5 mm ² × 4 cores (Including earth cable)	
	Connecting method				Terminal block (Screw fixing type)	
Accessories (included)					Mounting kit, Clean filter (Natural enzyme filter × 1, Photocatalytic washable deodorizing filter × 1)	
Optional parts					–	

Notes (1) The data are measured at the following conditions.

Operation	Item	Indoor air temperature		Outdoor air temperature		Standards
		DB	WB	DB	WB	
Cooling		27°C	19°C	35°C	24°C	ISO-T1, JIS C9612
Heating		20°C	–	7°C	6°C	ISO-T1, JIS C9612

The piping length is 7.5m.

- (2) The operation data are applied to the 220/230/240V districts respectively.
(3) The refrigerant quantity to be charged includes the refrigerant in 15 m connecting piping.
(Purging is not required even for the short piping.)
If the piping length is longer, when it is 15 to 25 m, add 20 g refrigerant per meter.

(2) Range of usage & limitations

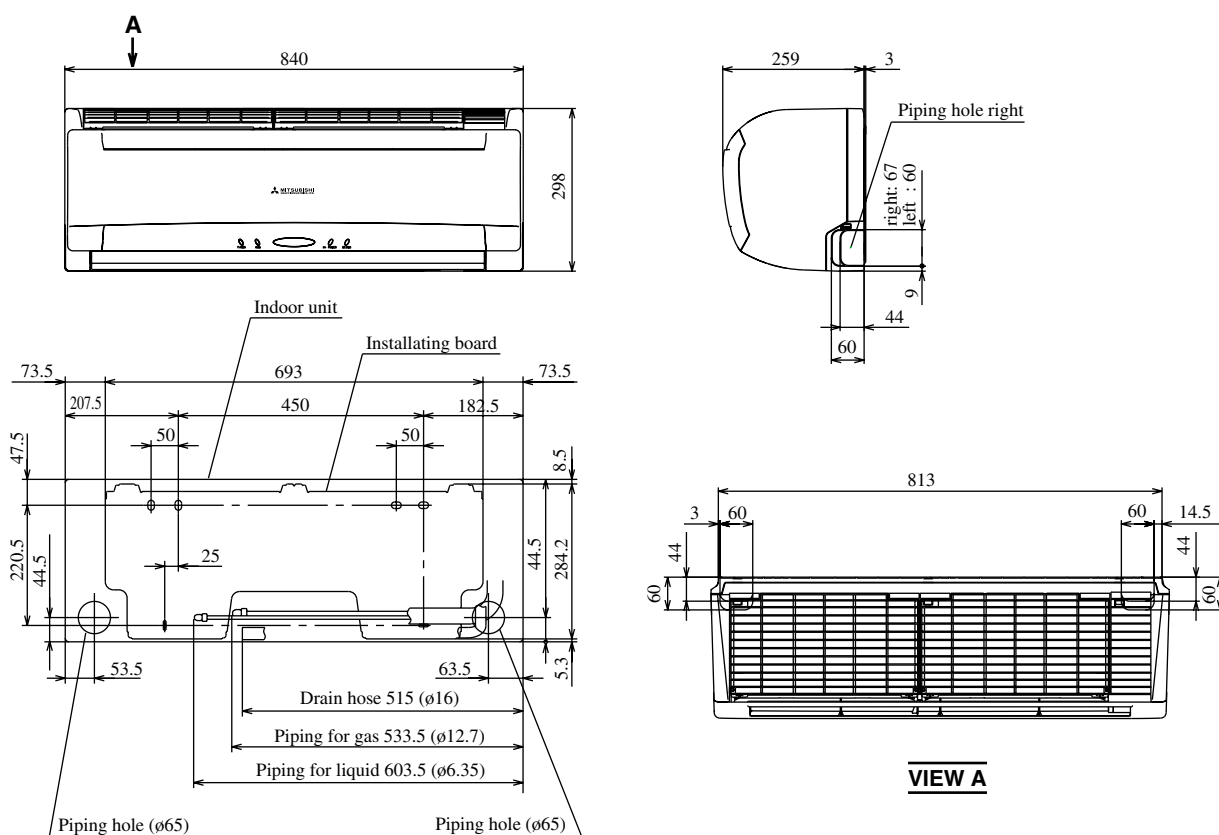
Item	Models	All models
Indoor return air temperature (Upper, lower limits)		Cooling operation : Approximately 21 to 32°C Heating operation : Approximately 15 to 30°C
Outdoor air temperature (Upper, lower limits)		Cooling operation : Approximately 21 to 43°C Heating operation : Approximately -5 to 21°C
Refrigerant line (one way) length		Max. 25m
Vertical height difference between outdoor unit and indoor unit		Max. 15m (Outdoor unit is higher) Max. 15m (Outdoor unit is lower)
Power source voltage		Rating $\pm$ 10%
Voltage at starting		Min. 85% of rating
Frequency of ON-OFF cycle		Max. 10 times/h
ON and OFF interval		Max. 3 minutes

(3) Exterior dimensions

(a) Indoor unit

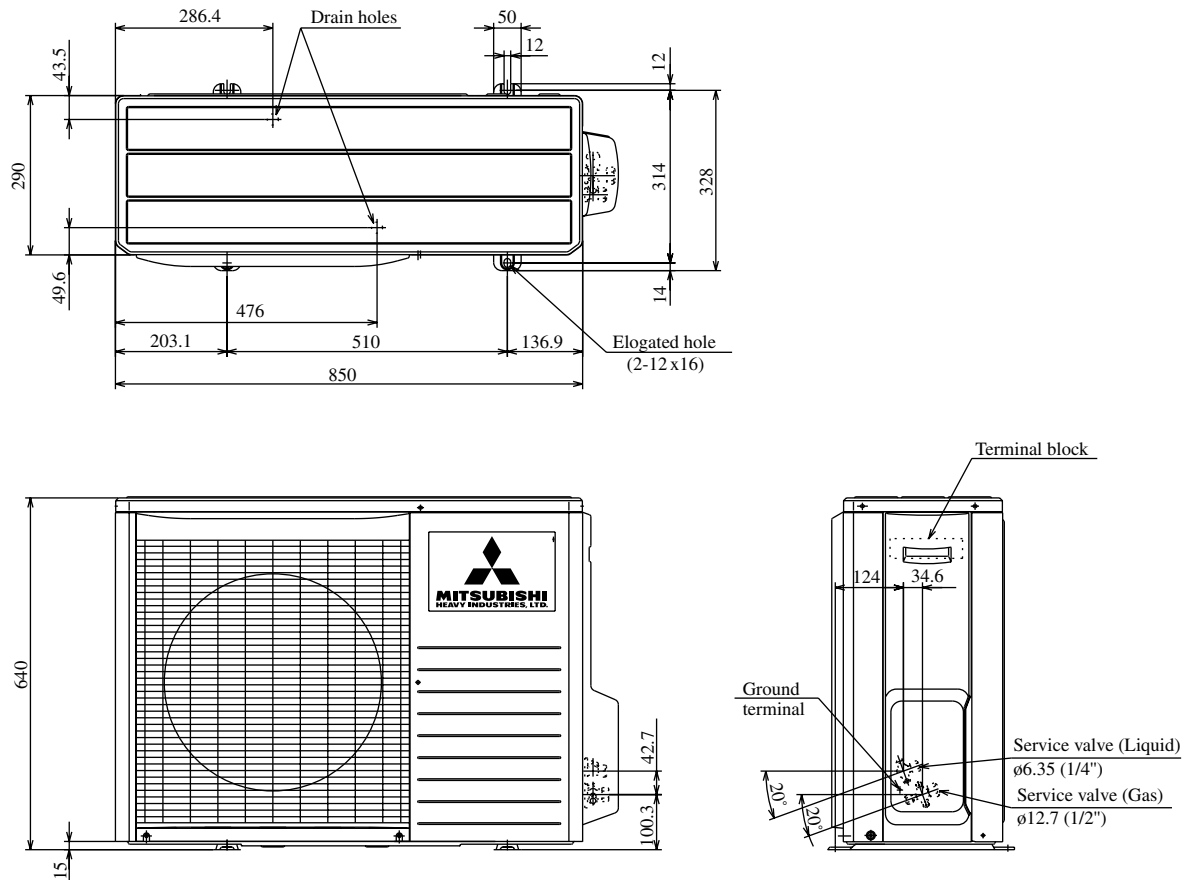
Models All models

Unit: mm



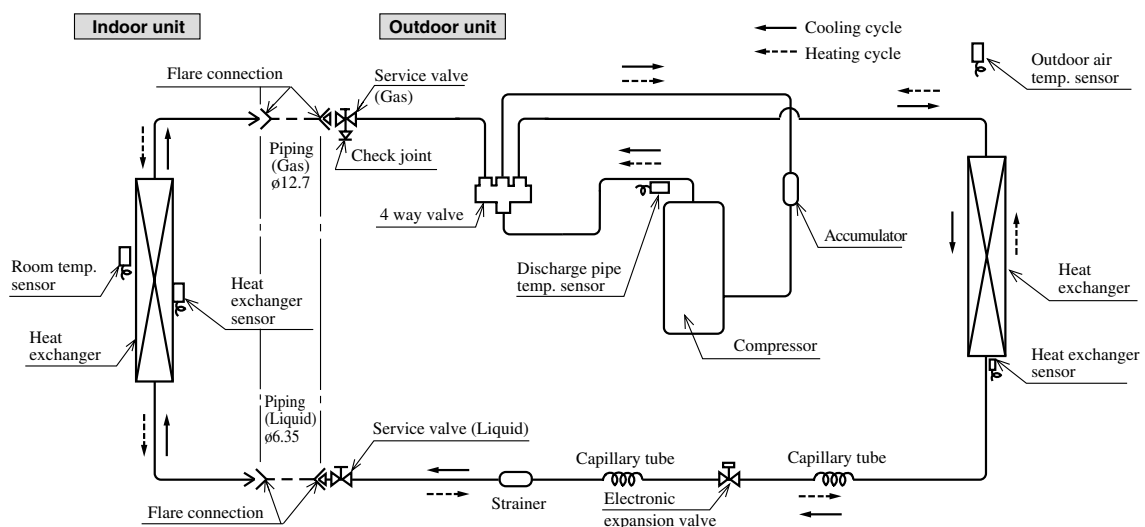
(b) Outdoor unit

Models All models



(4) Piping system

Models SRK50HE-S1, 56HE-S1

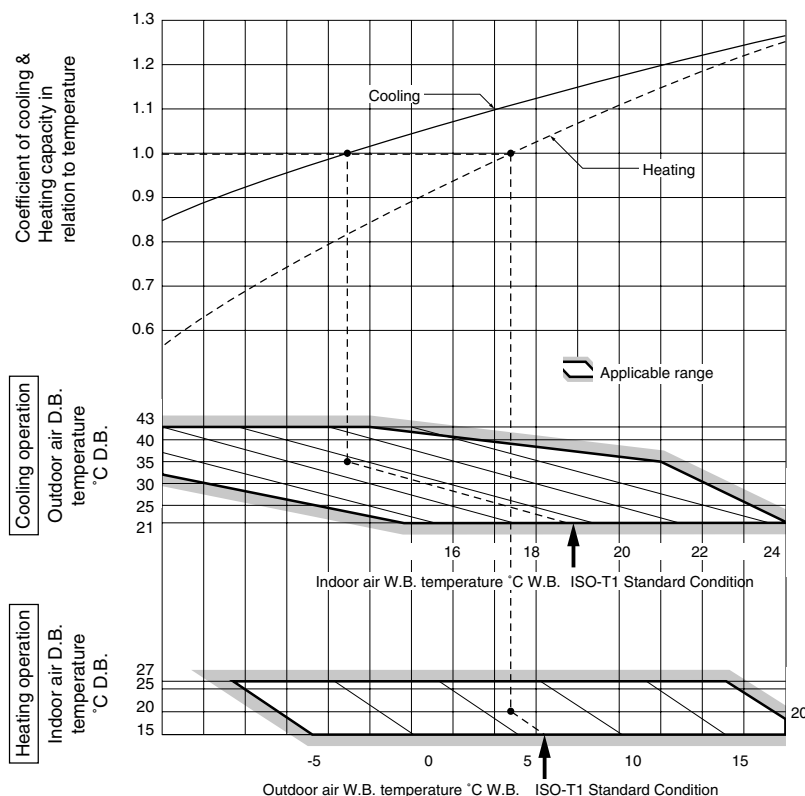


(5) Selection chart

Correct the cooling and heating capacity in accordance with the conditions as follows. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown on specification × Correction factors as follows.

(a) Coefficient of cooling and heating capacity in relation to temperatures



(b) Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way piping length between the indoor and outdoor units.

Piping length [m]	7	10	15	20	25
Cooling	1.0	0.99	0.975	0.965	0.95
Heating	1.0	1.0	1.0	1.0	1.0

(c) Correction relative to frosting on outdoor heat exchanger during heating

In additions to the foregoing corrections (a), (b) the heating capacity needs to be adjusted also with respect to the frosting on the outdoor heat exchanger.

Air inlet temperature of outdoor unit in °CWB	-5	-3	-1	1	3	5
Adjustment coefficient	0.91	0.88	0.86	0.87	0.92	1.00

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model SRK50HE-S1 with the piping length of 15m, indoor wet-bulb temperature at 19.0°C and outdoor dry-bulb temperature 35°C is Net cooling capacity = $\frac{4700}{\text{SRK50HE-S1}} \times \frac{0.975}{\text{Length 15m}} \times \frac{1.0}{\text{Factor by air temperatures}} = 4583 \text{ W}$

SRK50HE-S1

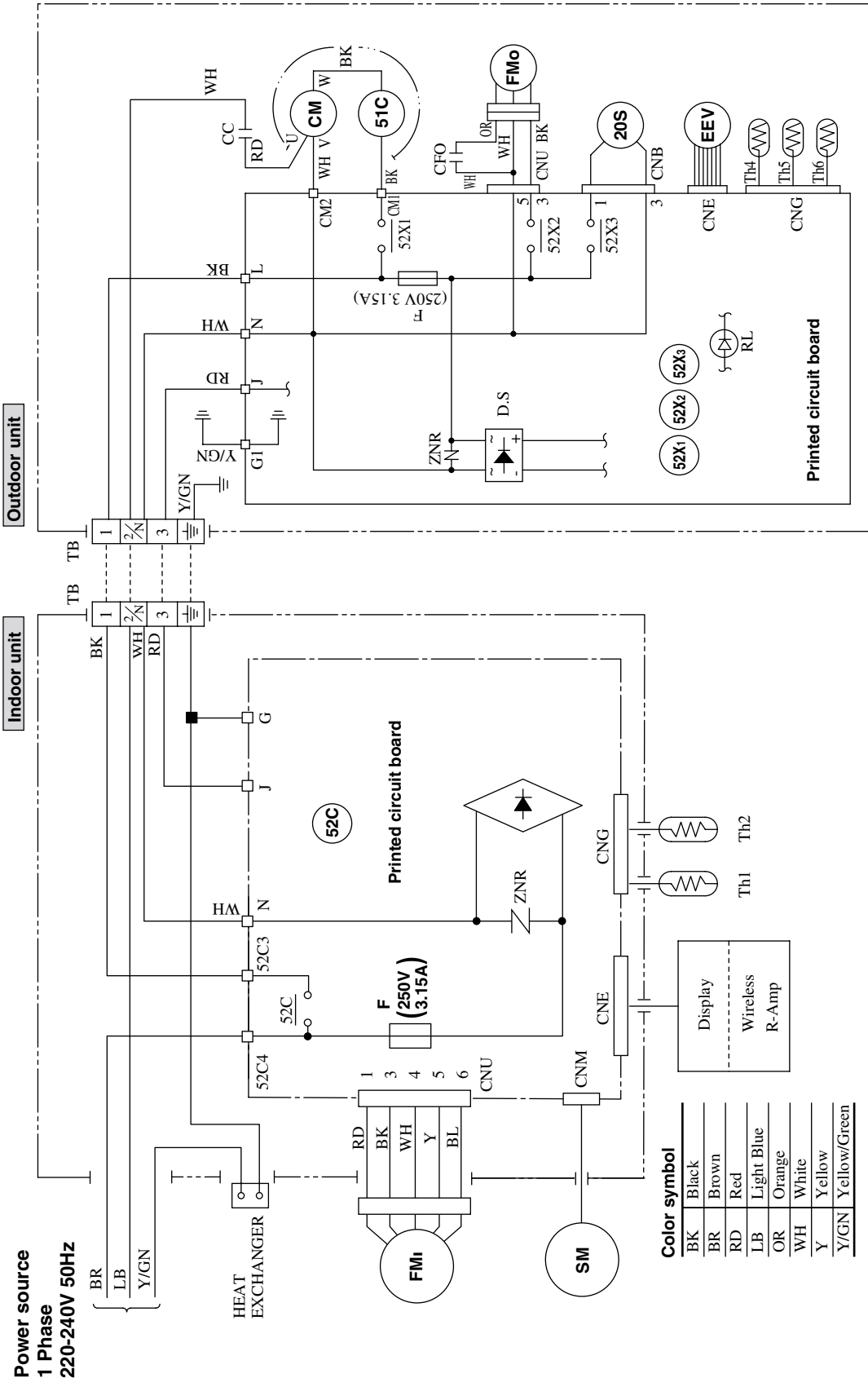
Length 15m

Factor by air temperatures

2.2.3 ELECTRICAL DATA

(1) Electrical wiring

Models SRK50HE-S1, 56HE-S1



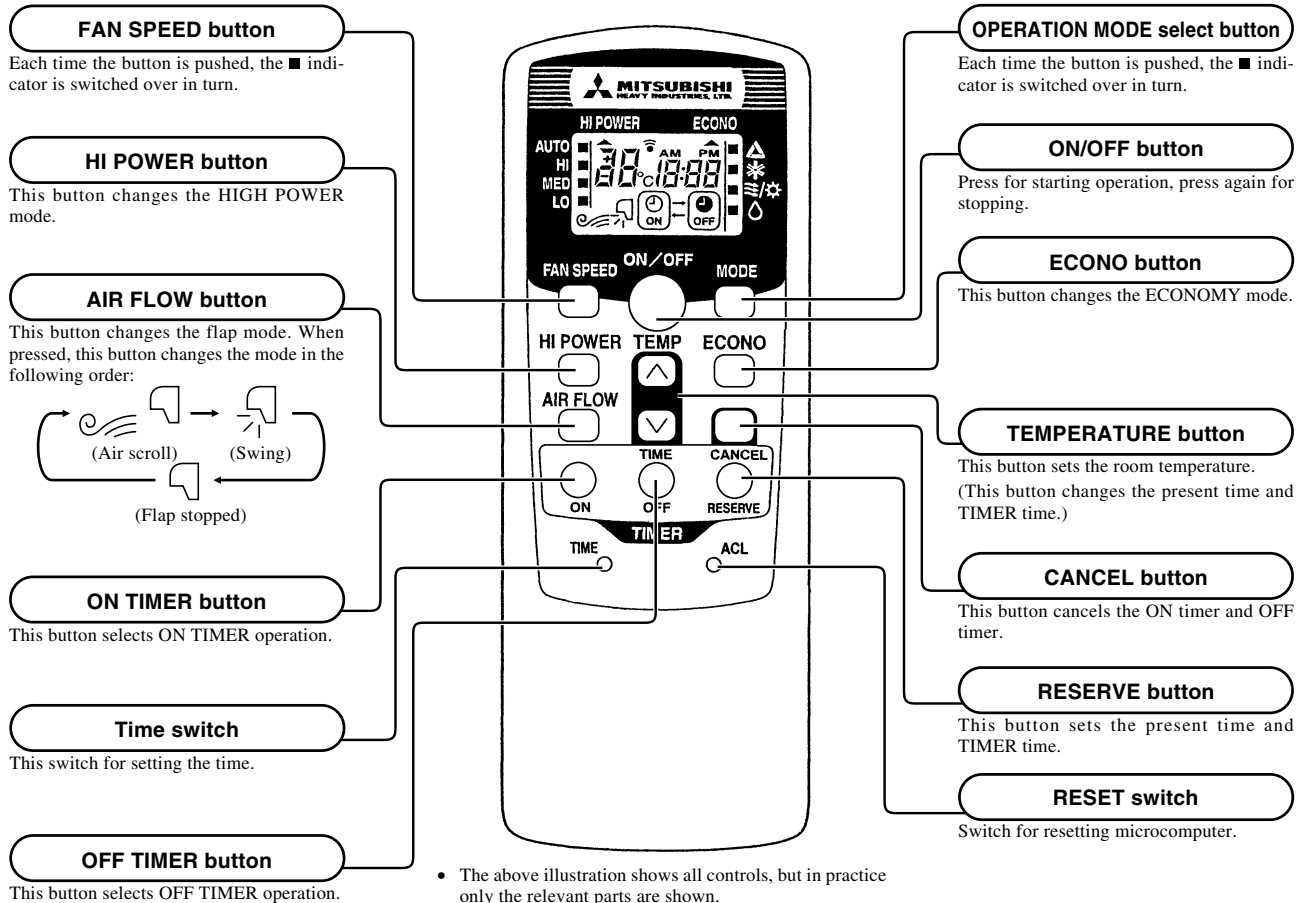
2.2.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

(1) Operation control function by remote control switch

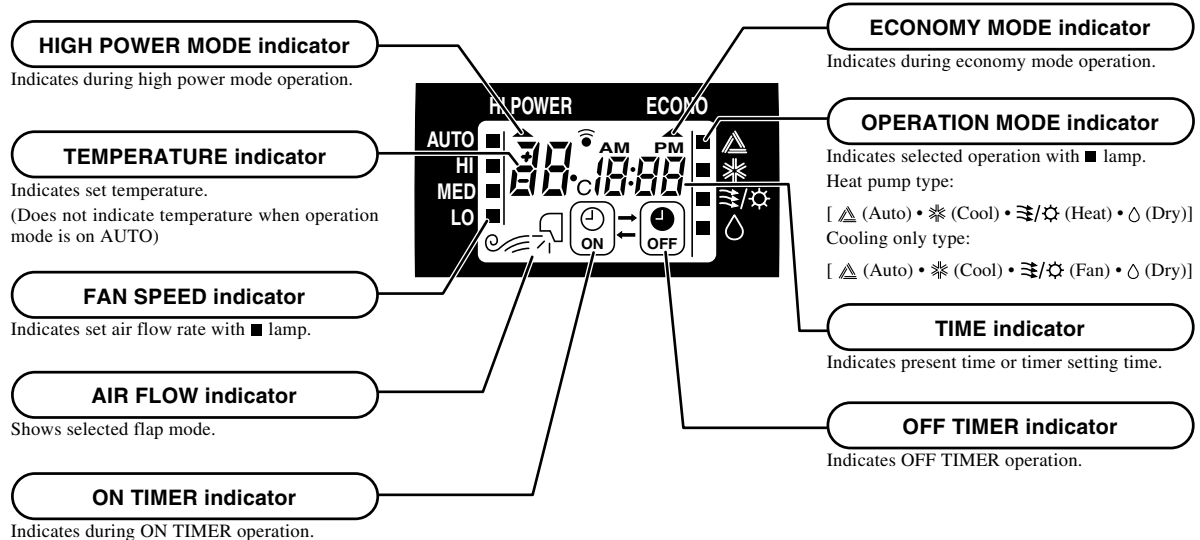
Remote controller

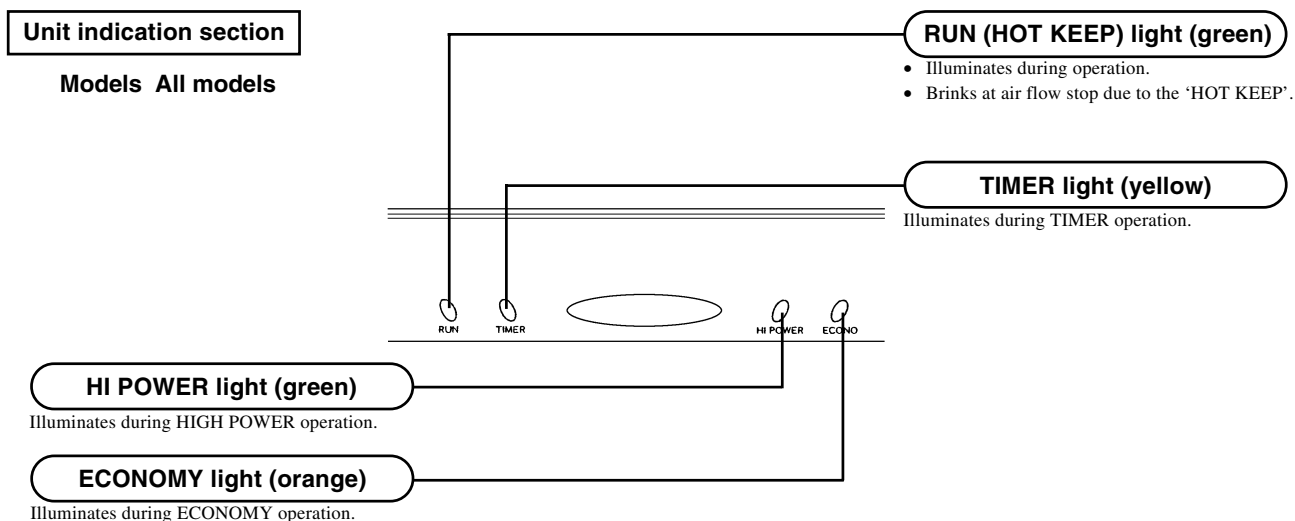
Models All models

◆ Operation section



◆ Indication section





(2) Unit ON/OFF button

When the remote controller batteries become weak, or if the remote controller is lost or malfunctioning, this button may be used to turn the unit on and off.

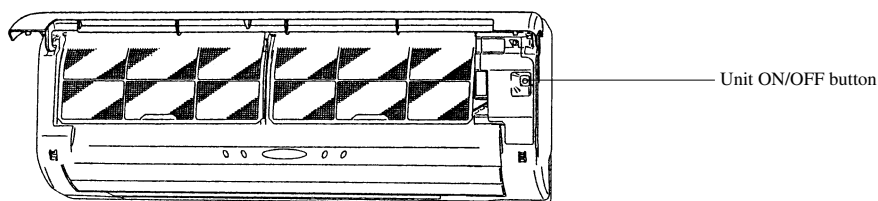
(a) Operation

Push the button once to place the unit in the automatic mode. Push it once more to turn the unit off.

(b) Details of operation

The unit will go into the automatic mode in which it automatically determines, from room temperature (as detected by sensor), whether to go into the cooling, thermal dry or heating modes.

Function	Room temperature setting	Fan speed	Flap	Timer switch
Cooling	About 25°C	Auto	Auto	Continuous
Thermal dry	About 25°C			
Heating	About 26°C			



(3) Power blackout auto restart function

(a) Power blackout auto restart function is a function that records the operational status of the air-conditioner immediately prior to it being switched off by a power cut, and then automatically resumes operations at that point after the power has been restored.

(b) The following settings will be cancelled:

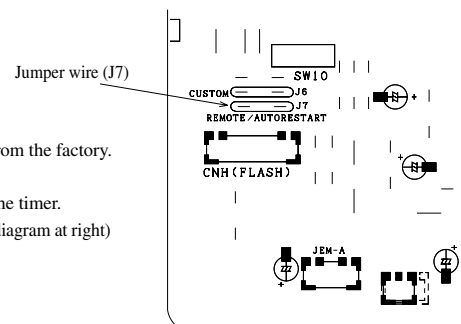
(i) Timer settings

(ii) High-power operations

Notes (1) The power blackout auto restart function is set at on when the air-conditioner is shipped from the factory. Consult with your dealer if this function needs to be switched off.

(2) When power failure occurs, the timer setting is cancelled. Once power is resumed, reset the timer.

(3) If the jumper wire (J7) "REMOTE/AUTORESTART" is cut, auto restart is disabled. (See the diagram at right)

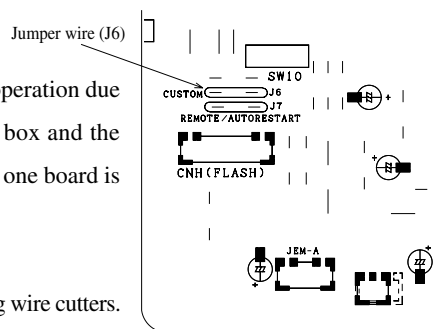


(4) Custom cord switching procedure

If two wireless remote controllers are installed in one room, in order to prevent wrong operation due to mixed signals, please modify the printed circuit board in the indoor unit's control box and the remote controller using the following procedure. Be sure to modify both boards. If only one board is modified, receiving (and operation) cannot be done.

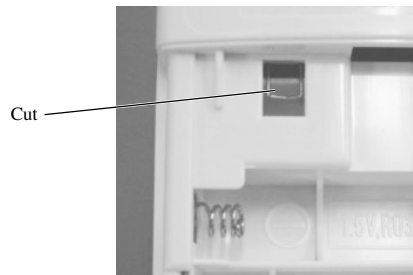
(a) Modifying the indoor unit's printed circuit board

Take out the printed circuit board from the control box and cut off jumper wire (J6) using wire cutters. After cutting of the jumper wire, take measures to prevent contact with the other the lead wires, etc.



(b) Modifying the wireless remote controller

- (i) Remove the battery.
- (ii) Cut the jumper wire shown in the figure at right.



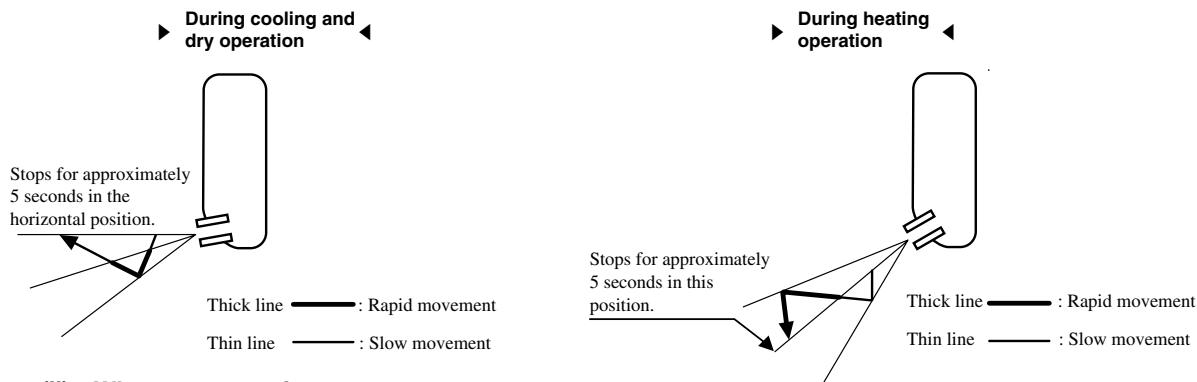
(5) Flap control

Control the flap by AIRFLOW button on the wireless remote controller.

(a) Air scroll

The flap will be automatically set to the angle of air flow best to operation.

(i) Starting time of operation



(ii) When not operating

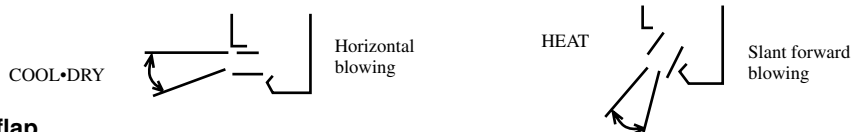
The flap returns to the position of air flow directly below, when operation has stopped.

(b) Memory flap

While the flap is operating if the AIRFLOW button is pushed once, it stops swinging at an angle.

As this angle is memorized in the microcomputer, the flap will be automatically set to the angle when next operation is started.

- Recommendable stopping angle of the flap



(c) Swing flap

Flap moves in upward and downward directions continuously.

(6) Comfortable timer setting

If the timer is set at ON when the operation select switch is set at the cooling or heating, or the cooling or heating in auto mode operation is selected, the comfortable timer starts and determines the starting time of next operation based on the initial value of 15 minutes and the relationship between the room temperature at the setting time (temperature of room temperature sensor) and the setting temperature.
(Max. 60 minutes)

Operation mode	Operation start time correction value (Min.)		
At cooling	$3 < \text{Room temp.} - \text{Setting temp.}$	$1 < \text{Room temp.} - \text{Setting temp.} \leq 3$	$\text{Room temp.} - \text{Setting temp.} \leq 1$
	+5	No change	-5
At heating	$3 < \text{Setting temp.} - \text{Room temp.}$	$2 < \text{Setting temp.} - \text{Room temp.} \leq 3$	$\text{Setting temp.} - \text{Room temp.} \leq 2$
	+5	No change	-5

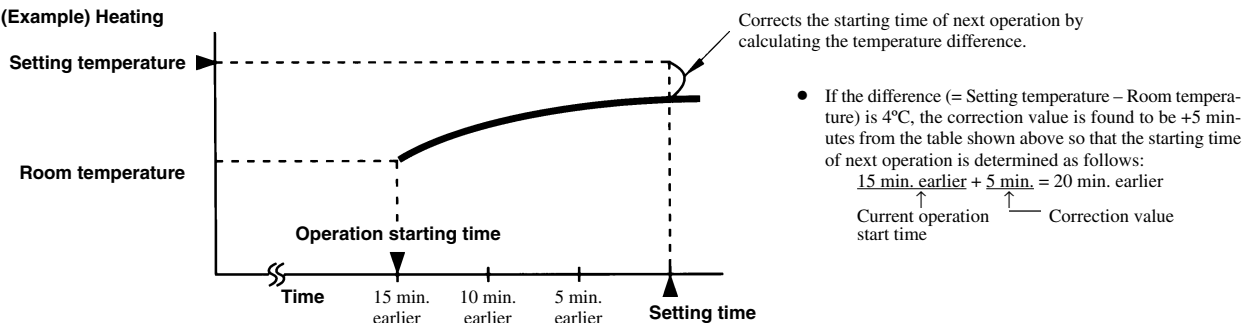
Notes (1) At 5 minutes before the timer ON time, operation starts regardless of the temperature of the room temperature sensor (Th1).

(2) This function does not actuate when the operation select switch is set at the dehumidifying as well as the dehumidifying in the auto mode.

However, the operation of item (1) above is performed during the dehumidifying in the auto mode.

(3) During the comfortable timer operation, both the run light and timer light illuminate and the timer light goes off after expiration of the timer, ON setting time.

(Example) Heating



(7) Outline of heating operation (Heat pump type only)

(a) Operation of major functional components

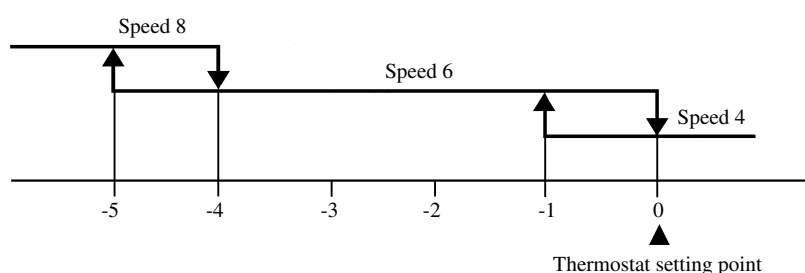
Functional components \ Item	When the compressor command is OFF	When the compressor command is ON	When the compressor goes OFF due to an anomalous stop.
Indoor fan motor	ON	ON	OFF
Flaps	ON or OFF	ON or OFF	Stop position control
Display	Lights up	Lights up	Lights up or flashes
52C	ON	ON	OFF after stop mode
Outdoor fan motor	OFF	ON	OFF
4-way valve	Depending on the stop mode	ON	Depending on the stop mode
Electric expansion valve		Depending on the EEV control	

(b) Fan speed switching

Fan speed switching \ Flow control	AUTO	HIGH	MED	LOW
Air scroll	Auto fan control	Speed 8	Speed 6	Speed 4
Swing flap		Speed 8	Speed 6	Speed 4
Swing stop		Speed 8	Speed 6	Speed 4

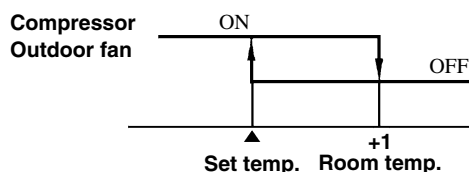
(i) Auto fan control

The indoor fan is automatically controlled in accordance with the difference between the room temperature (detected by the room temperature sensor) and the thermostat setting as shown below.



(c) Thermostat operation

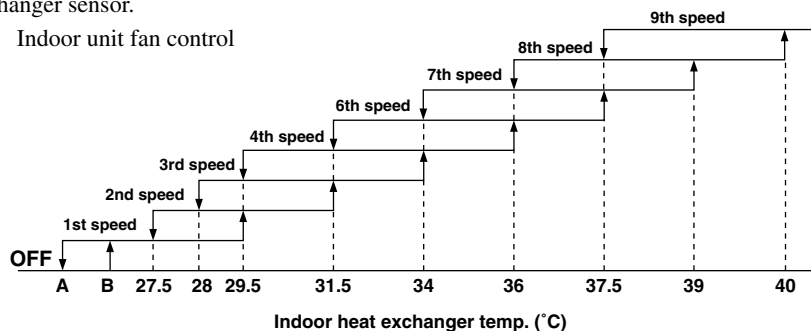
The compressor and outdoor fan are turned on and off as shown below according to the temperature setting.



(d) Hot keep

This function controls the indoor unit fan speed as shown below in accordance with the temperature sensed by the indoor heat exchanger sensor.

(i) Indoor unit fan control



• Values of A, B

	A	B
When the compressor command is OFF	22	25
When the compressor command is ON	17	19

Note (1) Refer to the table shown above right for the values A and B.

- (ii) To accomplish rapid recovery from the thermostat off state, after the compressor and outdoor unit's fan go OFF, the set temperature is raised by 1°C until 1 minute passes after the hot keep end temperature has been reached following restarting.

(e) Hot spurt

- (i) For 40 minutes after a heating operation begins, the system runs with set temperature raised by 2°C.
- (ii) In the following cases, this function is canceled and does not activate afterwards.
- 1) When the compressor and outdoor unit fan have been turned OFF by the thermostat going off.
 - 2) During high pressure control operation.

(f) HIGH POWER operation ("HI POWER" button on the remote controller : ON)

The system runs under the following conditions for 15 minutes without relation to the set temperature or the fan speed setting.

Indoor unit fan	Speed 9 fixed
Outdoor unit fan	ON
Compressor	ON

- Notes (1) Room temperature is not adjusted during the HIGH POWER operation.
- (2) Protective function will actuate with priority even during the HIGH POWER operation.

(g) Defrost operation

- (i) Starting conditions (Defrost operation begins when all the following conditions are satisfied.)

- ① 35 minutes have passed since the heating operation began. (Accumulated operation time)
- ② 35 minutes have passed since the previous defrosting operation ended. (Accumulated operation time)
- ③ The outdoor unit heat exchanger temperature sensor is -5°C or lower continuously for 3 minutes.
- ④ • The outdoor temperature $\geq -15^{\circ}\text{C}$

The difference between the outdoor temperature sensor temperature and the outdoor heat exchanger temperature sensor temperature is $\geq 6.0^{\circ}\text{C}$.

- The outdoor temperature $< -15^{\circ}\text{C}$

The difference between the outdoor temperature sensor temperature and the outdoor heat exchanger temperature sensor temperature is $\geq -5^{\circ}\text{C}$.

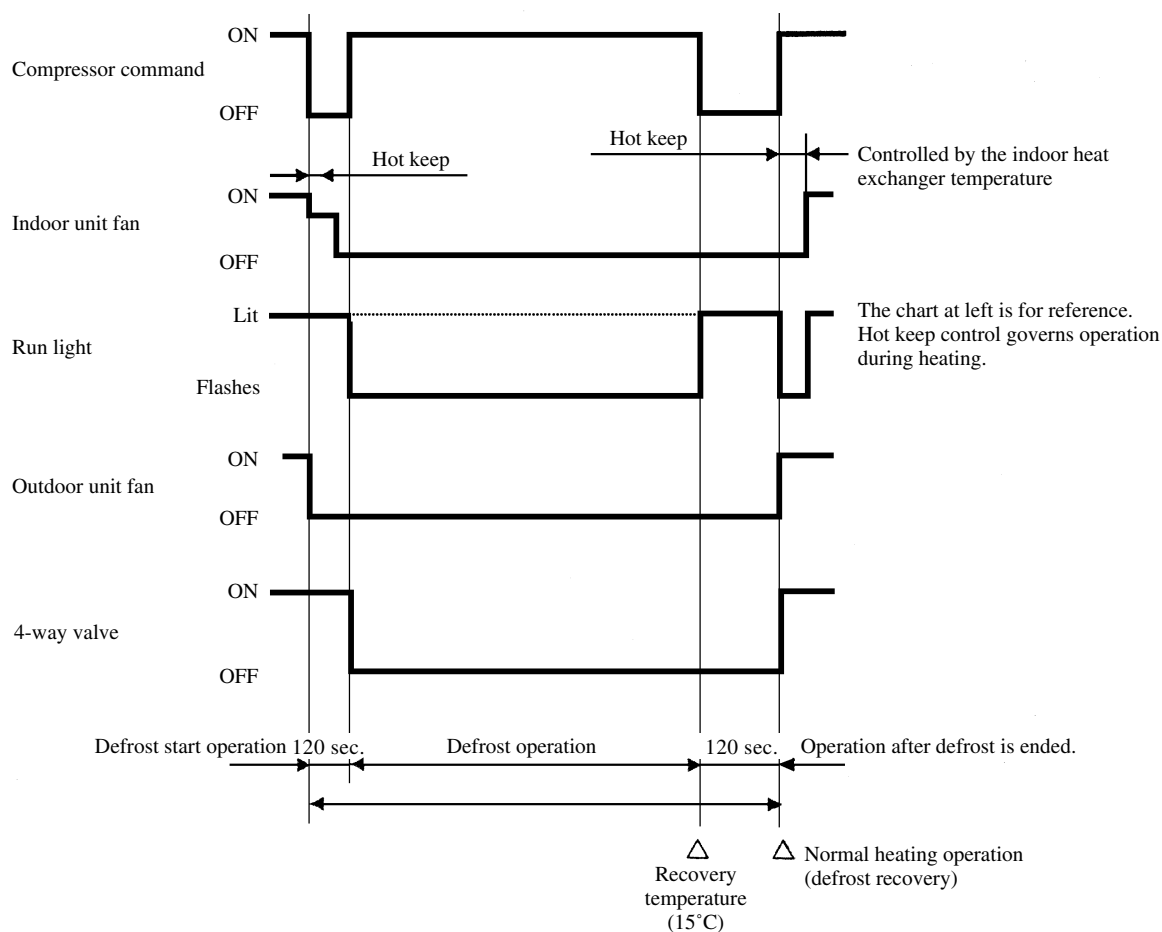
- ⑤ The compressor is running.

Also, the number of times the compressor goes OFF is counted, and when it reaches 10 or more times, if the conditions in ①, ② and ③ above (except that the outdoor heat exchanger temperature sensor is -1°C), the defroster operation starts.

- (ii) End conditions (when either of the following conditions is satisfied)

- ① Outdoor heat exchanger temperature sensor: 15°C or higher
- ② Defrosting operation has continued for 10 minutes.

(iii) Operation of functional components during defrosting operation



(h) Forced Defrost

- (i) Forced defrost operation can be performed only once time within 20 second, after the power source is turned on, in accordance with the following operation.

1) Remote control operation

Operation	Run
Operation mode	Heating
Set temperature	19°C
Fan speed select	Low
Air flow setting	Swing
On timer	ON
Current time	On after 180 min.condition
On timer time	

2) Functional components operation

Compressor	ON
4-way valve	OFF
Indoor unit fan	OFF
Flap	Fully closed
Outdoor unit fan	OFF
Display	Same as defrost

- (ii) If remote control operation is performed, for 1 minute after 3-minute timer operation, the operation is canceled if one of the following conditions is satisfied.

- ① Outdoor heat exchanger temperature sensor: 14°C or higher
- ② 10 minutes has passed (including the 1 minute of forced operation).

(i) ECONOMY operation (“ECONO” button on the remote controller : ON)

The set temperature changes as shown at right and the indoor unit fan runs at speed 4.

Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature -1.0
1~2 hours	Set temperature -2.0
2 hours ~	Set temperature -2.5

(8) Outline of cooling operation

(a) Operation of major functional components

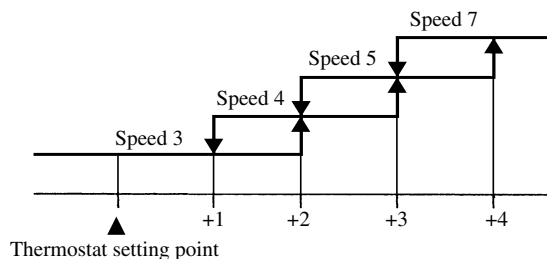
Functional components \ Item	When the compressor command is OFF	When the compressor command is ON	When the compressor goes OFF due to an anomalous stop.
Indoor fan motor	ON	ON	OFF
Flaps	ON or OFF	ON or OFF	Stop position control
Display	Lights up	Lights up	Lights up or flashes
52C	ON	ON	OFF after stop mode
Outdoor fan motor	OFF	ON	OFF
4-way valve	Depending on the stop mode	OFF	Depending on the stop mode
Electric expansion valve		Depending on the EEV control	

(b) Fan speed switching

Fan speed switching \ Flow control	AUTO	HIGH	MED	LOW
Air scroll	Auto fan control	Speed 7	Speed 5	Speed 3
Swing flap		Speed 7	Speed 5	Speed 3
Swing stop		Speed 7	Speed 5	Speed 3

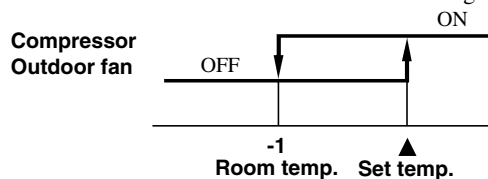
(i) Auto fan control

The indoor fan is automatically controlled in accordance with the difference between the room temperature (detected by the room temperature sensor) and the thermostat setting as shown below.



(c) Thermostat operation

The compressor and outdoor fan are turned on and off as shown below according to the temperature setting.



(d) HIGH POWER operation ("HI POWER" button on the remote controller : ON)

The following operation is performed for 15 minutes without relation to the set temperature or fan speed setting.

Indoor unit fan	Speed 8 fixed
Outdoor unit fan	ON
Compressor	ON

- Notes (1) Room temperature is not adjusted during the HIGH POWER operation.
(2) Protective functions will actuate with priority even during the HIGH POWER operation.

(e) ECONOMY operation ("ECONO" button on the remote controller : ON)

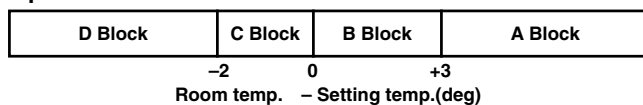
The set temperature changes as shown at right, and the indoor unit fan speed is set on speed 3.

Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature +0.5
1~2 hours	Set temperature +1.0
2 hours ~	Set temperature +1.5

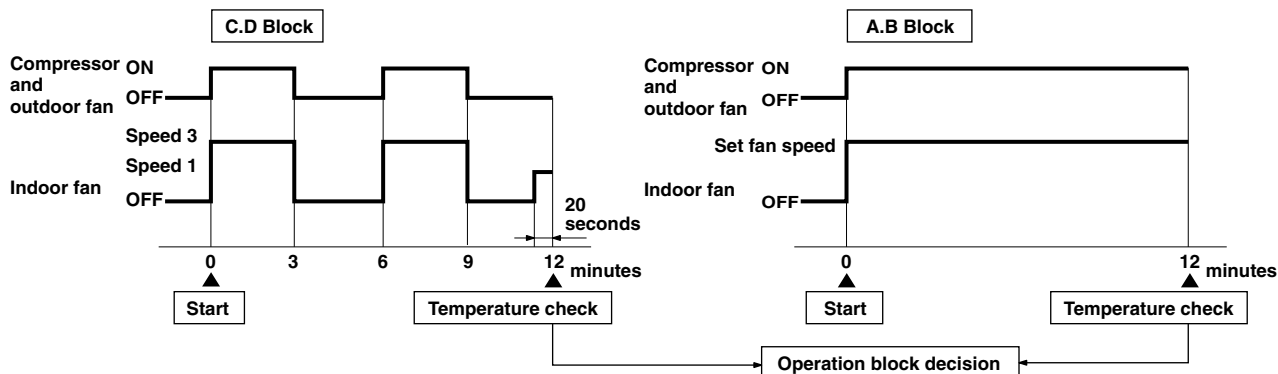
(9) Outline of dehumidifying operation

- (a) Choose the appropriate operation block area by the difference between room temperature and thermostat setting temperature as shown below.

• Operation block area



- (b) Start up operation

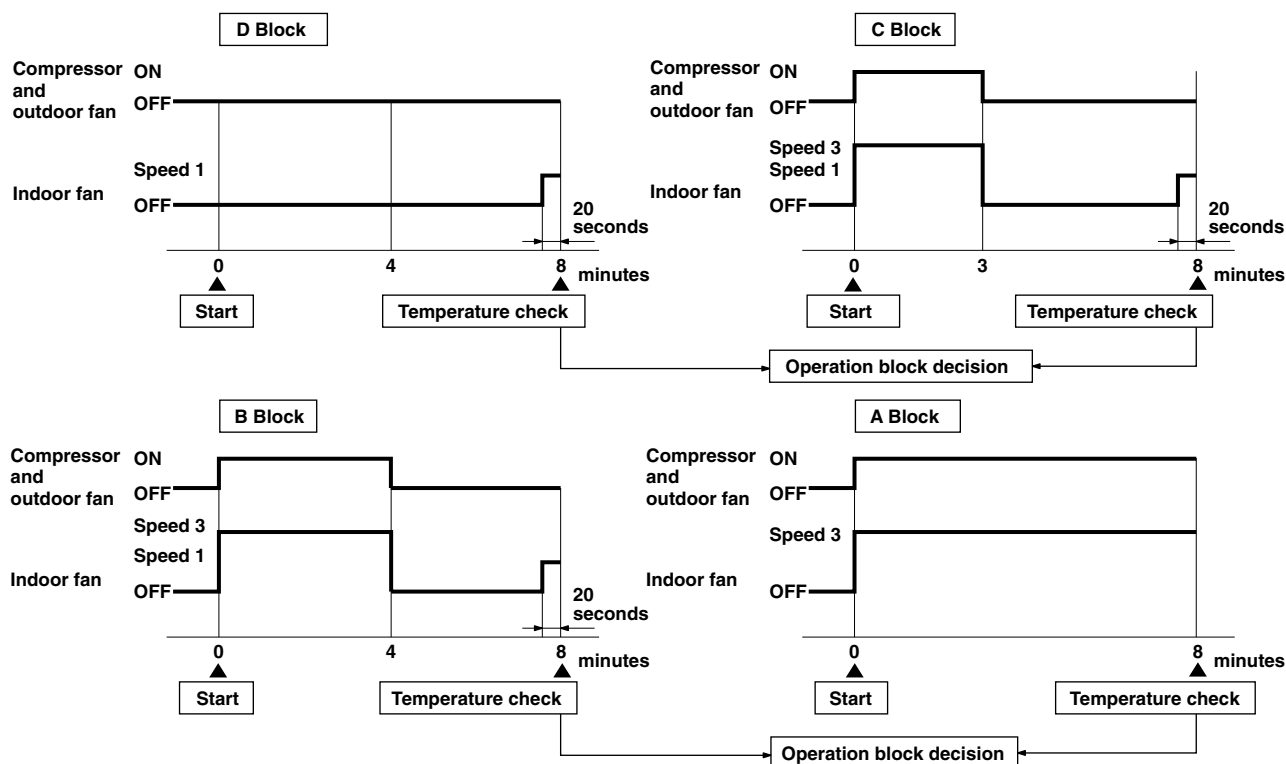


Note (1) Thermostat operation is performed in A, B Block. When compressor and indoor fan stop by thermostat operation within 12 minutes from start, temperature check is performed by operating indoor fan at speed 1 for 20 seconds before finishing 12 minutes and allowing decision of next operation block.

- (c) DRY operation

After finishing start up operation described in (b) above, thermal dry operation is performed at 8 minutes intervals, according to the difference between room temperature and thermostat setting temperature as shown below.

Beside, 1 cycle of this operating time consists of 8 minutes, 7 cycle operation is performed then.



- (d) ECONOMY operation ("ECONO" button on the remote controller : ON)

The set temperature changes as shown at right, and the indoor unit fan speed is set on speed 3 .

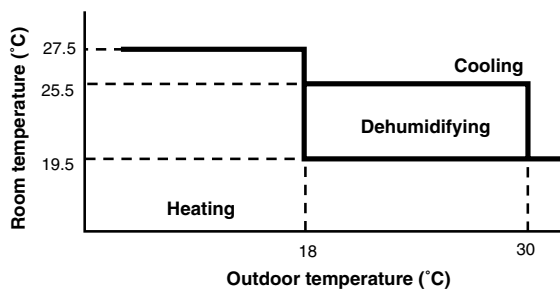
Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature +0.5
1~2 hours	Set temperature +1.0
2 hours ~	Set temperature +1.5

(10) Outline of automatic operation

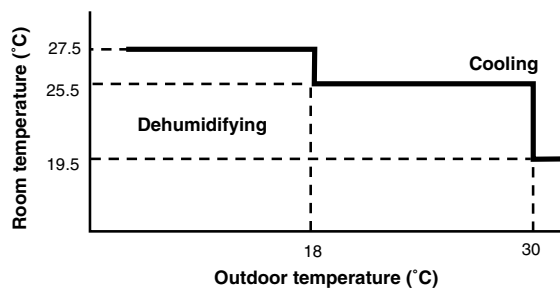
(a) Determination of operation mode

The unit checks the room temperature and the outdoor air temperature after operating the indoor and outdoor blowers for 20 seconds, determines the operation mode and the room temperature setting correction value, and then begins in the automatic operation.

• Heat pump type



• Cooling only type



- (b) Within 30 minutes after either auto or manual operation stops, if auto operation is started, or if you switch to auto operation during manual operation, the system runs in the previous operation mode.
- (c) The temperature is checked 1 time in 30 minutes after the start of operation, and if the judgment differs from the previous operation mode, the operation mode changes.
- (d) Setting temperature can be adjusted within the following range. There is the relationship as shown below between the signals of the wireless remote controller and the setting temperature.

		Signals of wireless remote controller (Display)												
		-6	-5	-4	-3	-2	-1	±0	+1	+2	+3	+4	+5	+6
Setting temperature	Cooling	19	20	21	22	23	24	25	26	27	28	29	30	31
	Dehumidifying	19	20	21	22	23	24	25	26	27	28	29	30	31
	Heating	20	21	22	23	24	25	26	27	28	29	30	31	32

(11) Outline of fan operation (Cooling only type only)

(a) Operation of major functional components

Fan speed switching	High power	AUTO	HIGH	MED	LOW	ECONO
Functional components						
52C	OFF					
Indoor fan motor	Speed 8	Speed 7	Speed 6	Speed 5	Speed 4	Speed 3
Outdoor fan motor	OFF					
Flaps	Depend on the flap control					

(b) HIGH POWER operation (“HI POWER” button on the remote controller : ON)

The following operation is performed for 15 minutes without relation to the set temperature or fan speed setting.

Indoor unit fan	Speed 8 fixed
Outdoor unit fan	OFF
Compressor	OFF

Note (1) Protective functions will actuate with priority even during the HIGH POWER operation.

(12) Protective control function

(a) Frost prevention for indoor heat exchanger (During cooling or dehumidifying)

(i) Operating conditions

- (i) Indoor heat exchanger temperature sensor (detected with Th2) is lower than 2.5°C.
- (ii) 10 minutes elapsed after the start of operation.

(ii) Detail of frost prevention operation

Compressor	OFF
Indoor fan	Protects the fan tap just before frost prevention control.
Outdoor fan	OFF
4-way valve	Stop mode

(iii) **Reset conditions:** Indoor heat exchanger temperature sensor (Th2) is higher than 8°C.

(b) Indoor fan motor protection

When the air-conditioner is operating and the indoor fan motor is turned ON, if the indoor fan motor has operated at 300 rpm or under for more than 30 seconds, the unit enters first in the stop mode and then stops the entire system.

Timer light illuminates simultaneously and the run light flashing 6 times at each 8-second.

(c) Three-minute forced operation

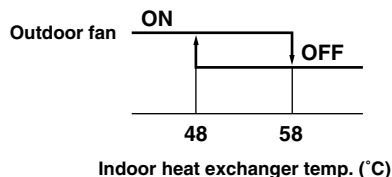
When the compressor begins operating the thermal operation is not effective for 3 minutes, so operation continues as is in the operation mode. (After 3 minutes has passed the thermal operation is effective.)

However, stopping the compressor via a stop signal or protection control has priority.

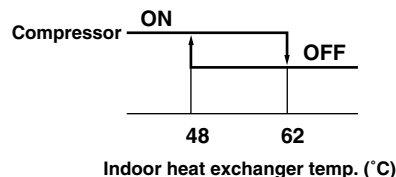
(d) High-pressure control

The indoor heat exchanger temperature sensor detection temperature controls the outdoor fan and compressor.

- When the indoor heat exchanger temperature is $\geq 58^{\circ}\text{C}$



- When the indoor heat exchanger temperature is $\geq 62^{\circ}\text{C}$



(e) Heating overload protective control

(i) **Operating conditions:** when the unit is heating with the compressor is on, and the outdoor air temperature rose beyond 17°C for 30 seconds continuously.

(ii) **Detail of operation:** indoor fan speed is raised forcibly by 1 step.

(iii) **Reset conditions:** when the outdoor air temperature drops below 16°C.

(f) Abnormality of outdoor unit

(i) Cooling operation

When the indoor heat exchanger temperature does not fall to 25°C or below for 40 minutes after 5 minutes have elapsed since the compressor operation start, the abnormality stop occurs. (The timer light flashes 2 times.)

(ii) Heating operation

① The indoor heat exchanger temperature $< 5^{\circ}\text{C}$ for 5 minutes and more

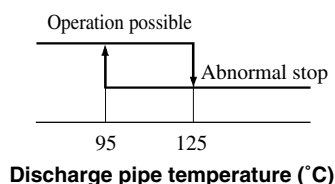
The unit is stopped due to the outdoor unit abnormality excepting the defrost operation time. (The timer light flashes 2 times.)

② $5^{\circ}\text{C} \leq$ the indoor heat exchanger temperature $< 30^{\circ}\text{C}$ for 40 minutes and more

When the indoor heat exchanger temperature does not rise to 30°C or over for more than 40 minutes after 5 minutes have elapsed since the compressor operation start, the abnormality stop occurs. However, when the indoor fan began operation once, this function is not activated until the unit is stopped or the mode is changed. (The timer light flashes 2 times when 20 minutes have elapsed.)

(g) Compressor overheat protection

If the discharge pipe temperature (sensed by Th6) exceeds the set temperature value, the compressor stops. If the temperature is 95°C or lower after a 3-minute delay, it starts again, but if this function is reactivated again within 60 minutes, it results in an abnormal stop.
(Run light : ON, Timer light : 5 time flash, outdoor unit LED : 5 time flash)



(h) Serial signal transmission error protection

(i) Purpose: Prevents malfunction resulting from error on the indoor ↔ outdoor signals.

(ii) Detail of operation: When the indoor unit controller ↔ outdoor unit controller signals cannot be received, the compressor is stopped immediately. Simultaneously, the red LED on the printed circuit board of outdoor unit controller flashing 6 times for 0.5 second at intervals of 8 seconds. Once the operation stops, it does not start any more.

(The run light illuminates simultaneously and timer light on the indoor unit flashing 6 times at the same time.)

(i) Sensor disconnection (room temperature, indoor heat exchanger, outdoor heat exchanger, outdoor temperature, discharge pipe)

(i) Room temperature sensor

If the temperature detected by the room temperature sensor is –20°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed. (Run light: 2 time flash, Time light: ON)

(ii) Indoor heat exchanger temperature sensor

If the temperature detected by the indoor heat exchanger temperature sensor is –20°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed.

Also, if the temperature detected by the indoor heat exchanger temperature sensor is –20°C or lower continuously for 3 minutes after heating operation has started, the indoor unit's fan speed is forcibly raised to speed 5. After this, the air-conditioner is stopped if the detected temperature remains at –20°C continuously for 40 minutes. (Run light : 1 time flash, Timer light : ON)

(iii) Outdoor heat exchanger temperature sensor

If the temperature detected by the outdoor heat exchanger temperature sensor is –64°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed.

Also, the air-conditioner is stopped if the temperature detected by the outdoor heat exchanger temperature sensor remains at –50°C or lower continuously for 40 minutes after heating operation has started. (Run light : keep flashing, Timer light : 2 time flash)

(iv) Outdoor air temperature sensor

If the temperature detected by the outdoor air temperature sensor is –64°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed. (Run light : keep flashing, Timer light : 1 time flash)

(v) Discharge pipe temperature sensor

After the compressor has operated for 9 minutes continuously, if there is a disconnected signal for the discharge pipe temperature sensor detected –64°C for 15 seconds, the compressor stops. After a 3-minute delay, it restarts, but if an abnormality is detected 4 times continuously, the air-conditioner is stopped fully and an error indication is displayed. (Run light : keep flashing, Timer light : 4 time flash)

2.2.5 APPLICATION DATA

SAFETY PRECAUTIONS

- Please read these “Safety Precautions” first then accurately execute the installation work.
- Though the precautionary points indicated herein are divided under two headings, **⚠ WARNING** and **⚠ CAUTION**, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the **⚠ WARNING** section. However, there is also a possibility of serious consequences in relationship to the points listed in the **⚠ CAUTION** section as well. In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.
- After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner’s manual. Moreover, ask the customer to keep this sheet together with the owner’s manual.



WARNING

- To disconnect the appliance from the mains supply this appliance must be connected to the mains by means of a circuit breaker or a switch (use a recognized 16A) with a contact separation of at least 3mm.
- The appliance shall be installed in accordance with national wiring regulations.
- This system should be applied to places as households, residences and the like. Application to inferior environment such as engineering shop could cause equipment malfunction.
- Please entrust installation to either the company which sold you the equipment or to a professional contractor. Defects from improper installations can be the cause of water leakage, electric shocks and fires.
- Execute the installation accurately, based on following the installation manual. Again, improper installations can result in water leakage, electric shocks and fires.
- For installation, confirm that the installation site can sufficiently support heavy weight. When strength is insufficient, injury can result from a falling of the unit.
- For electrical work, please see that a licensed electrician executes the work while following the safety standards related to electrical equipment, and local regulations as well as the installation instructions, and that only exclusive use circuits are used.
Insufficient power source circuit capacity and defective installment execution can be the cause of electric shocks and fires.
- Accurately connect wiring using the proper cable, and insure that the external force of the cable is not conducted to the terminal connection part, through properly securing it. Improper connection or securing can result in heat generation or fire.
- Take care that wiring does not rise upward, and accurately install the lid/service panel. It's improper installation can also result heat generation or fire.
- When setting up or moving the location of the air conditioner, do not mix air etc. or anything other than the designated refrigerant (R410A) within the refrigeration cycle.
Rupture and injury caused by abnormal high pressure can result from such mixing.
- Always use accessory parts and authorized parts for installation construction. Using parts not authorized by this company can result in water leakage, electric shock, fire and refrigerant leakage.
- Ventilate the work area when refrigerant leaks during the operation. 
Coming in contact with fire, refrigerant could generate toxic gas.
- Confirm after the foundation construction work that refrigerant does not leak.
If coming in contact with fire of a fan heater, a stove or movable cooking stove, etc., refrigerant leaking in the room could generate toxic gas.
- In joining pipes, do not use conventional (R22) piping flare nuts, etc. The use of conventional piping materials may lead to the rupture of piping due to higher pressure used for the refrigerant cycle and possible personal injury.
(Use only piping material designed specifically for R410A)



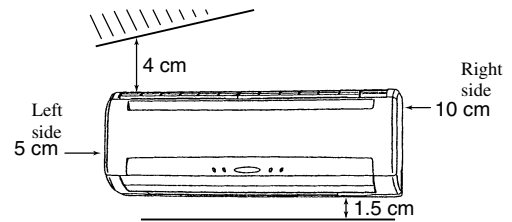
CAUTION

- Execute proper grounding. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or a telephone ground wire. 
Improper placement of ground wires can result in electric shock.
- The installation of an earth leakage breaker is necessary depending on the established location of the unit. Not installing an earth leakage breaker may result in electric shock.
- Do not install the unit where there is a concern about leakage of combustible gas. 
The rare even of leaked gas collecting around the unit could result in an outbreak of fire.
- For the drain pipe, follow the installation manual to insure that it allows proper drainage and thermally insulate it to prevent condensation. Inadequate plumbing can result in water leakage and water damage to interior items.
- Do not place objects near the outdoor unit or allow leaves to gather around the unit. If there are objects or leaves around the outdoor unit, small animals may enter unit and contact electrical parts resulting in break down, emission of smoke or flame.

(1) Selection of location for installation

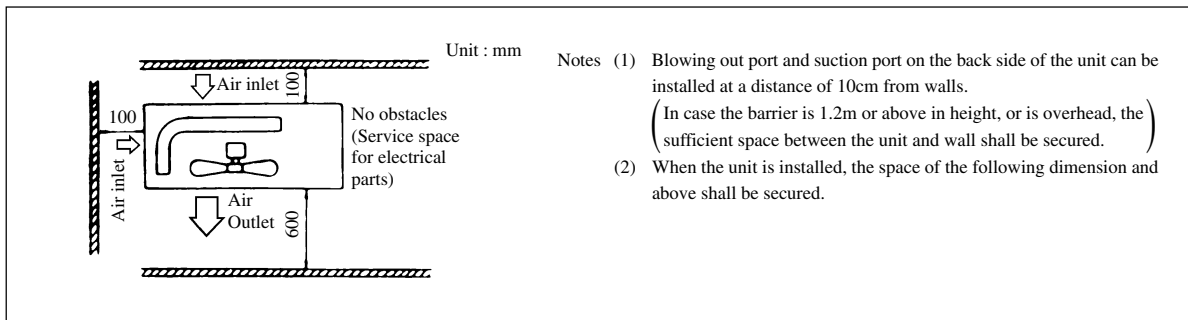
(a) Indoor unit

- Where there is no obstructions to the air flow and where the cooled air can be evenly distributed.
- A solid place where the unit or the wall will not vibrate.
- A place where there will be enough space for servicing. (Where space mentioned right can be secured)
- Where wiring and the piping work will be easy to conduct.
- The place where receiving part is not exposed to the direct rays of the sun or the strong rays of the street lighting.



(b) Outdoor unit

- A place where good air circulation can be obtained and where rain, snow or sunshine will not directly strike the unit.
- A place where discharged hot air or unit's operating sound will not be a nuisance to the neighborhood.
- A place where servicing space can be secured.
- A place where vibration will not be enlarged.
- Do not install the unit near the seaside, or where there is possibility of chlorine gas generation.

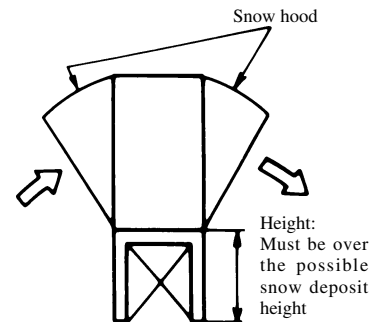


- In heating operation, snow deposit on the heat-exchanger of outdoor unit must be prevented for keeping the normal performance capacity. (Heat pump type only)

- Snow-hood on outdoor unit as in drawing, will reduce the frequency of defrost operation.

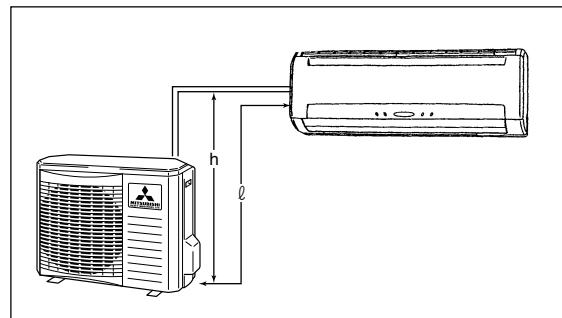
When installing the snow hood, take care so that the air outlet of the snow hood will not face directly into the most windy direction.

- Design the base higher than possible snow deposit.



(c) Limitations for one way piping length and vertical height difference.

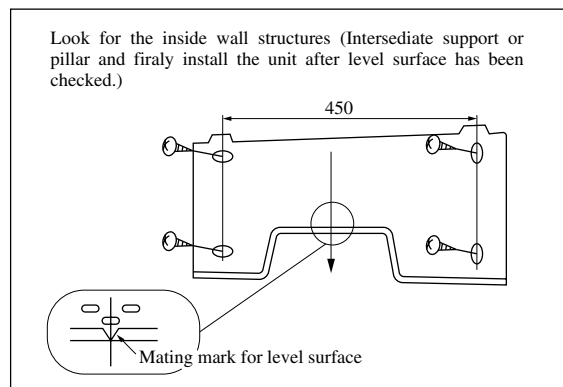
Model		All models
Item		
One way piping length (ℓ)		25 m
Vertical height difference (h)	Outdoor unit is lower	15 m
	Outdoor unit is higher	15 m



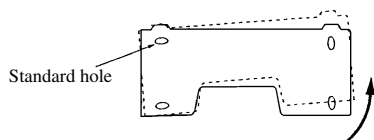
(2) Installation of indoor unit

(a) Installation of installation board

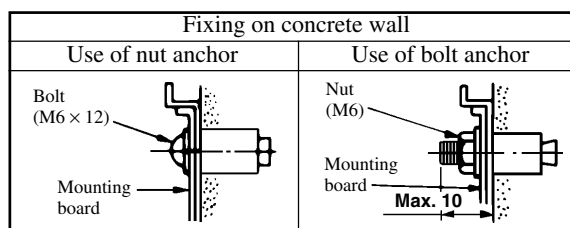
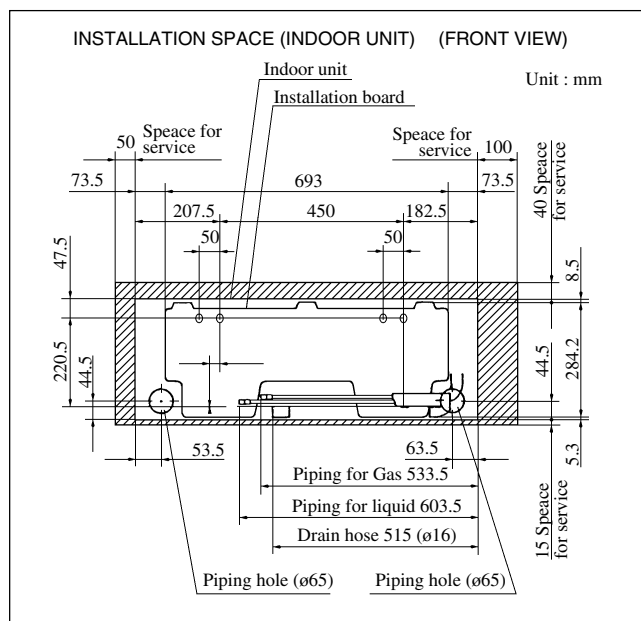
(i) Fixing of installation board



Adjustment of the installation board in the horizontal direction is to be conducted with four screws in a temporary tightened state.



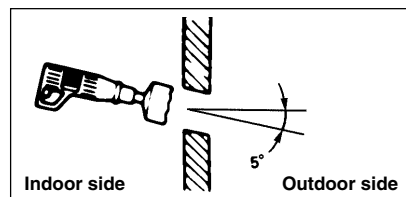
Adjust so that board will be level by turning the board with the standard hole as the center.



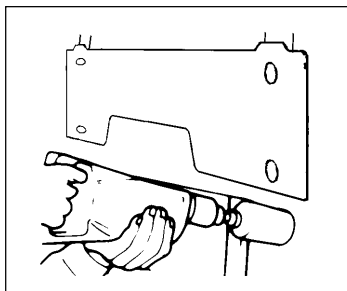
(b) Drilling of holes and fixture sleeve (Option parts)

When drilling the wall that contains a metal lath, wire lath or metal plate, be sure to use pipe hole sleeve sold separately.

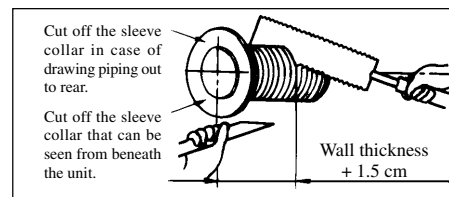
(i) Drill a hole with ø65 whole core drill



Note (1) Drill a hole with incline of 5 degree from indoor side to outdoor side.

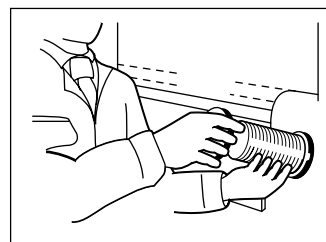


(ii) Adjusting sleeve length

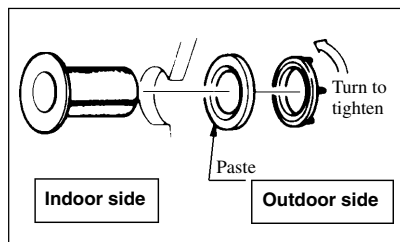


(iii) Install the sleeve

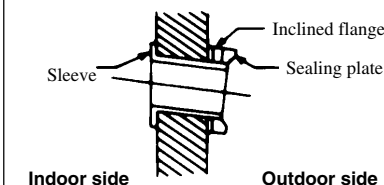
(Inserting sleeve)



(*Sleeve + *Inclined + *Sealing plate)



View of sleeve when installed



(c) Preparation of indoor unit

(i) Mounting of connecting wires

- 1) Remove the lid.
- 2) Remove the wiring clamp.
- 3) Connect the connecting wire securely to the terminal block.

Use cables for interconnection wiring to avoid loosening of the wires.

CENELEC code for cables. Required field cables.

H05RNR3G1.5 (Example) or 245IEC57

H Harmonized cable type

05 300/500 volts

R Natural-and/or synth, rubber wire insulation

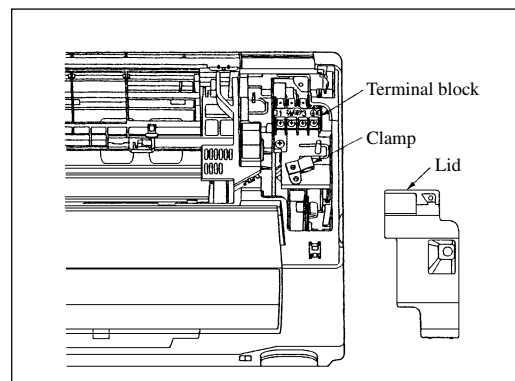
N Polychloroprene rubber conductors insulation

R Standed core

4or5 Number of conductors

G One conductor of the cable is the earth conductor (yellow/green)

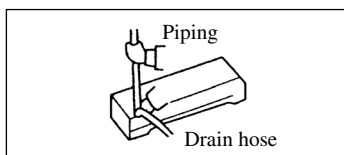
1.5 Section of copper wire (mm²)



- ① Connect the connection wire securely to the terminal block. If the wire is not affixed completely, contact will be poor, and it is dangerous as the terminal block may heat up and catch fire.
- ② Take care not to confuse the terminal numbers for indoor and outdoor connections.
- ③ Affix the connection wire using the wiring clamp.
- 4) Fix the connecting wire by wiring clamp.
- 5) Attach the lid.
- 6) Close the air inlet panel.

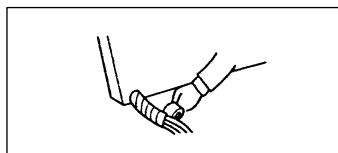
(ii) Installing the support of piping

[Shaping the piping]



- Hold the bottom of the piping and fix direction before stretching it and shaping it.

[Taping of the exterior]

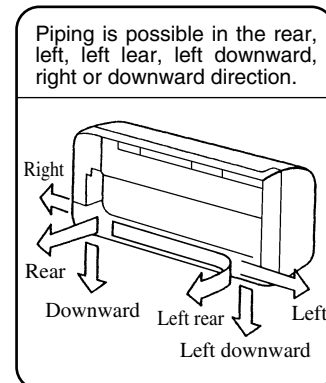


- Tape only the portion that goes through the wall.
Always tape the crossover wiring with the piping.

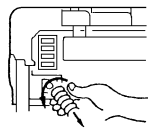
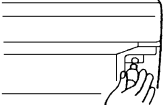
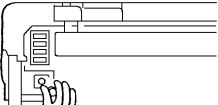
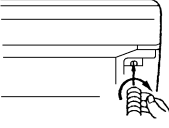
[When the hose is extended to left and taken out from the rear center]

[Top View]

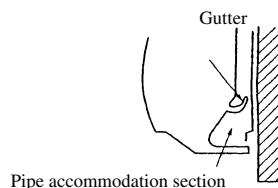
Left-hand-sided-piping	Right-hand-sided-piping
Piping in the left rear direction Piping in the left direction	Piping in the right rear direction Piping in the right direction



[Drain hose changing procedures]

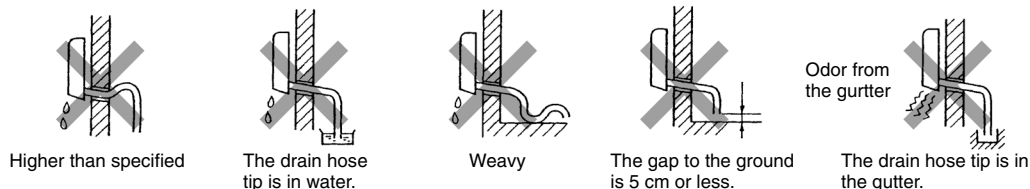
1. Remove the drain hose.	2. Remove the drain cap.	3. Insert the drain cap.	4. Connect the drain hose.
			
● Remove the drain hose, making it rotate.	● Remove it with hand or pliers.	● Insert the drain cap which was removed at procedure "2" securely using a hexagonal wrench, etc. Note: Be careful that if it is not inserted securely, water leakage may occur.	● Insert the drain hose securely, making it rotate. Note: Be careful that if it is not inserted securely, water leakage may occur.

Since this air conditioner has been designed to collect dew drops on the rear surface to the drain pan, do not attach the power cord above the gutter.

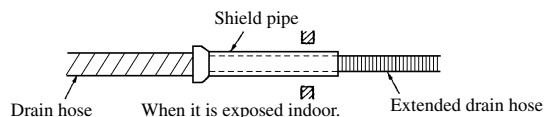


Drainage

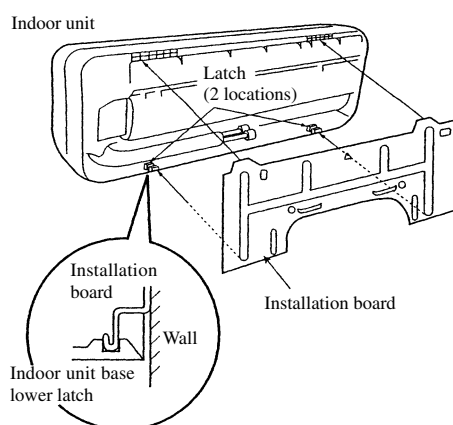
- Arrange the drain hose in a downward angle.
- Avoid the following drain piping.

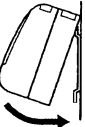
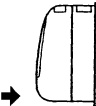


- Pour water to the drain pan located under the heat exchanger, and ensure that the water is discharged outdoor.
- When the extended drain hose is indoor, always use a shield pipe (to be arranged by the user) and ensure it is thermally insulated.

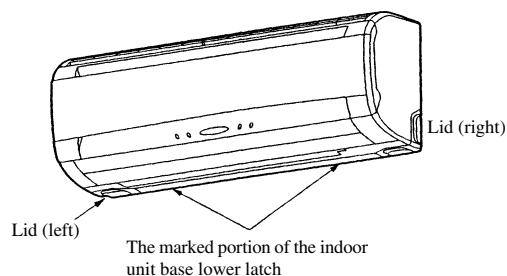


(iii) Fixing of indoor unit



Installation Steps	
① Pass the pipe through the hole in the wall, and hook the upper part of the indoor unit to the installation board.	
② Gently push the lower part to secure the unit.	

- How to remove the indoor unit from the installation board
 - ① Remove the right and left lids.
 - ② At the marked portion of the indoor unit base lower latch, pull downward with fingers.
(both right and left hand sides)
(The indoor unit base lower latch can be removed from the installation board)



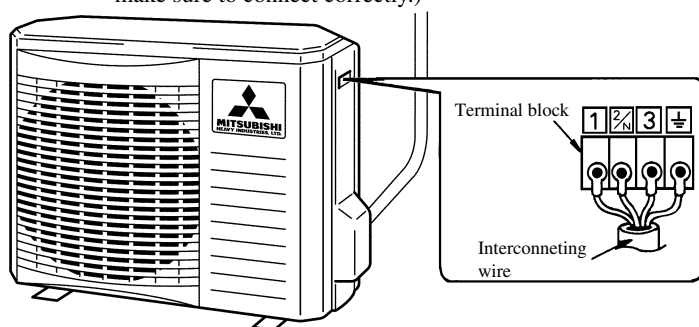
(3) Installation of outdoor unit

(a) Installation of outdoor unit

- (i) Make sure that sufficient space for installation and service is secured.
- (ii) Fix the leg sections of the unit on a firm base which will not play.
Attach cushion pads, etc. between the unit and the mounting fixtures not to transmit vibration to the building.
- (iii) Attach a drain elbow, etc. under the drain port of the bottom plate to guide drain water.
(Drain elbow should not be used where days when temperature drops below 0°C continue for several days. Draining may be disturbed by frozen water.)
- (iv) When installing the unit at a higher place or where it could be toppled with strong winds, secure the unit firmly with foundation bolts, wire, etc.

(b) Connection of indoor and outdoor connecting wiring

- (i) Connect the wiring according to the number of the indoor terminal block. (Mis-wiring may cause the burning damage, and make sure to connect correctly.)



1	Brown	For power supply, indoor outdoor
$\frac{2}{N}$	Blue	Connecting wiring
3	Black	Indoor/outdoor signal wire (Low voltage)
$\perp$	Yellow/Green	Earth wiring terminal

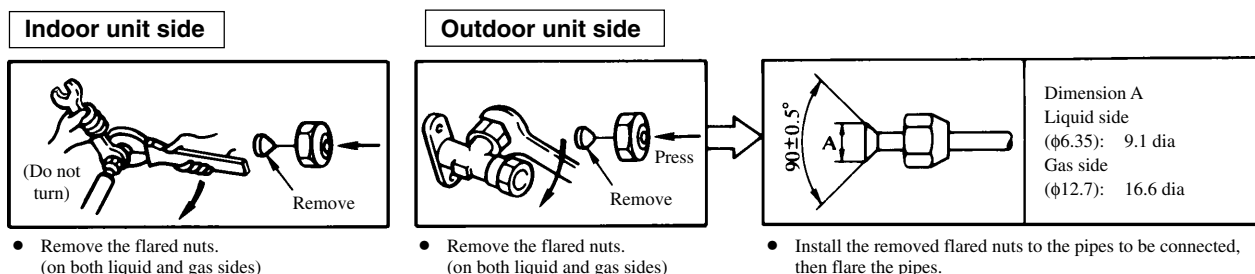
Notes (1) To prevent the mis-operation by noise, when the connecting wire too long for indoor and outdoor. Please hide the fixed wire in the pipe or use vinyl tape to set. Do not put wire into the unit.

(2) Please let the authorized personal to decide by indoor wiring code whether connect the leakage breaker or not.

(4) Refrigerant piping

(a) Preparation

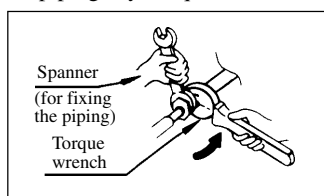
Keep the openings of the pipes covered with tapes etc. to prevent dust, sand, etc. from entering them.



(b) Connection of refrigerant piping

Indoor unit side

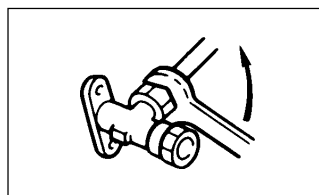
- Connect firmly gas and liquid side pipings by Torque wrench.



- Specified torquing value:
Liquid side (φ6.35) : 14.0~18.0N·m (1.4~1.8kgf·m)
Gas side (φ12.7) : 49.0~61.0N·m (4.9~6.1kgf·m)
- Always use a Torque wrench and back up spanner to tighten the flare nut.

Outdoor unit side

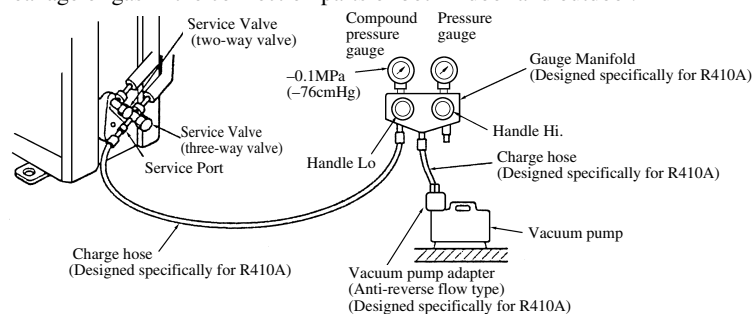
- Connect firmly gas and liquid side pipings by Torque wrench.



- Specified torquing value:
Liquid side (φ6.35) : 14.0~18.0N·m (1.4~1.8kgf·m)
Gas side (φ12.7) : 49.0~61.0N·m (4.9~6.1kgf·m)
- Use one more spanner to fix the valve.

(c) Air purge

- (i) Tighten all flare nuts in the pipings both indoor and outside will so as not to cause leak.
- (ii) Connect service valve, charge hose, manifold valve and vacuum pump as is illustrated below.
- (iii) Open manifold valve handle Lo to its full width, and perform vacuum or evacuation.
Continue the vacuum or evacuation operation for 15 minutes or more and check to see that the vacuum gauge reads -0.1 MPa (-76 cmHg).
- (iv) After completing vacuum operation, fully open service valve (Both gas and liquid sides) with hexagon headed wrench.
- (v) Detach the charge hoses.
- (vi) Check for possible leakage of gas in the connection parts of both indoor and outdoor.



- Since the system uses service ports differing in diameter from those found on the conventional models, a charge hose (for R22) presently in use is not applicable.
Please use one designed specifically for R410A
- Please use an anti-reverse flow type vacuum pump adapter so as to prevent vacuum pump oil from running back into the system.
Oil running back into an air-conditioning system may cause the refrigerant cycle to break down.

Additional refrigerant charge

When refrigerant piping exceeds 15m conduct additional refrigerant charge by weight after refrigerant piping completion.
Additional charge amount per meter = 20g/m

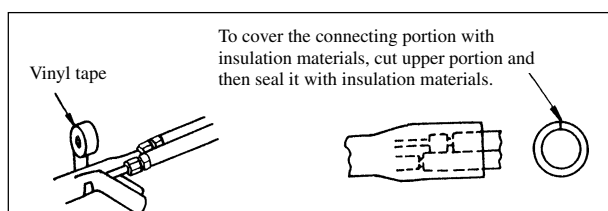
[Example]

How much amount of additional charge for 25m piping?

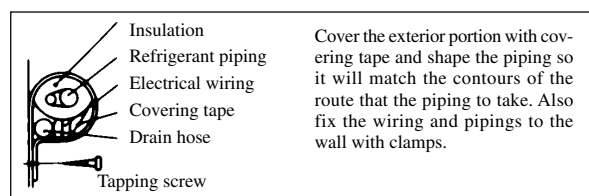
$(25 - 15)m \times 20g/m = 200g$ 200g for additional charge

(d) Insulation of connecting portion

- (i) Cover the connecting portion of the refrigerant piping with the pipe cover and seal them.
If neglecting to do so, moisture occurs on the piping and water will drip out.



- (ii) Finishing and fixing
 - 1) Tie up the piping with wrapping tape, and shape it so that it conforms to which the pipe is attached.
 - 2) Fix them with clamps as right figure.



(5) Test run

- (a) Conduct trial run after confirming that there is no gas leaks.
- (b) When conducting trial run set the remote controller thermostat to continuous operation position. However when the power source is cut off or when the unit's operation switch is turned off or was turned to fan operation position, the unit will not go into operation in order to protect the compressor.
- (c) Insert in electric plug into the electric outlet and make sure that it is not loose.
 - 1) When there is something wrong with the electric outlet and if the insertion of the electric plug is insufficient, there may occur a burn out.
 - 2) It is very important to be careful of above when plugging in the unit to an already furnished electrical outlet.

(d) Explain to the customer on the correct usage of the air conditioner in simple layman's terms.

(e) Make sure that drain flows properly.

(f) **Standard operation data**

(220/230/240V)

Model		SRK50HE-S1	SRK56HE-S1
Item			
High pressure (MPa)	Cooling	—	—
	Heating	2.6~2.8	2.8~3.0
Low pressure (MPa)	Cooling	0.8~1.0	0.8~1.0
	Heating	—	—
Temp. difference between return air and supply air (°C)	Cooling	14~16	15~17
	Heating	20~22	23~25
Running current (A)	Cooling	6.5/6.3/6.0	7.3/7.1/6.8
	Heating	6.5/6.2/6.0	7.4/7.1/6.8

Model		SRK50CE-S1	SRK56CE-S1
Item			
Low pressure (MPa)	Cooling	0.8~1.0	0.8~1.0
Temp. difference between return air and supply air (°C)	Cooling	14~16	15~17
Running current (A)	Cooling	6.5/6.3/6.0	7.3/7.1/6.8

Note (1) The data are measured at following conditions

Ambient air temperature

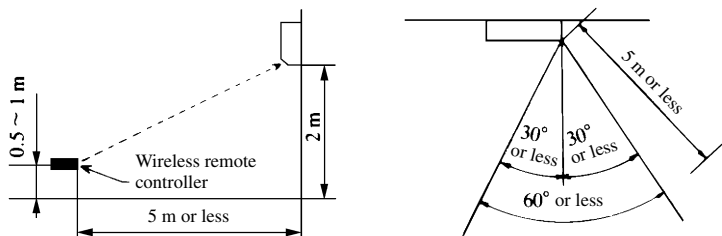
Indoor side: Cooling ... 27°C DB, 19°C WB, Heating ... 20°C DB

Outdoor side: Cooling ... 35°C DB, 24°C WB, Heating ... 7°C DB, 6°C WB

(6) Precautions for wireless remote controller installation and operation

(a) Wireless remote controller covers the following distances:

(i) When operating facing the air conditioner:



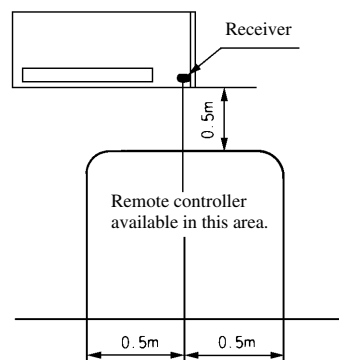
Notes (1) The remote controller is correctly facing the sensing element of the air conditioner when being manipulated.

(2) The typical coverage is indicated (in the left illustration). It may be more or less depending on the installation.

(3) The coverage may be less or even nil. If the sensing element is exposed to strong light, such as direct sunlight, illumination, etc., or dust is deposited on it or it is used behind a curtain, etc.

(ii) When manipulating the remote controller mounted on a wall:

Make sure that it works normally (i.e., transmission/reception signal is audible) before mounting.



2.2.6 MAINTENANCE DATA

(1) Troubleshooting procedures for electrical equipment

(a) Cautions

- ① If you are disassembling and checking an air conditioner, be sure to turn off the power before beginning. When working on indoor units, let the unit sit for about 1 minute after turning off the power before you begin work. When working on an outdoor unit, there may be an electrical charge applied to the main circuit (electrolytic condenser), so begin work only after discharging this electrical charge (to DC 10 V or lower).
- ② When taking out printed circuit boards, be sure to do so without exerting force on the circuit boards or package components.
- ③ When disconnecting and connecting connectors, take hold of the connector housing and do not pull on the lead wires.

(b) Items to check before troubleshooting

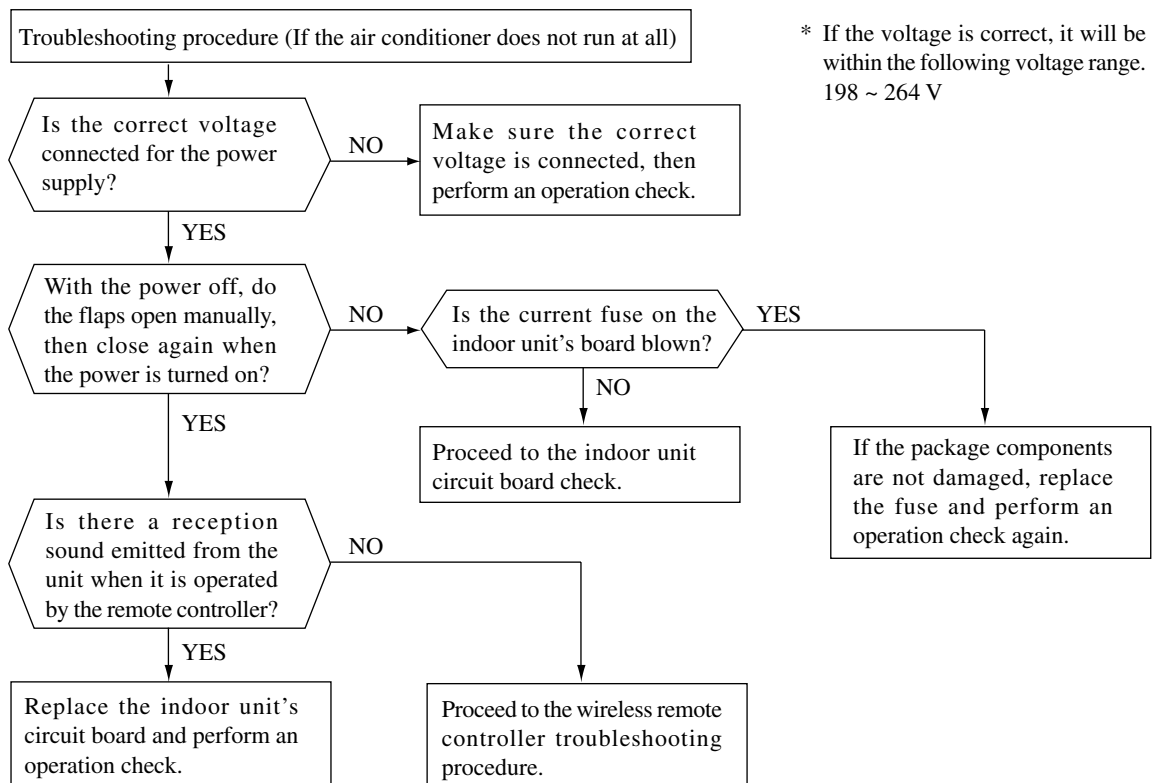
- ① Have you thoroughly investigated the details of the trouble which the customer is complaining about?
- ② Is the air conditioner running? Is it displaying any self-diagnosis information?
- ③ Is a power supply with the correct voltage connected?
- ④ Are the control lines connecting the indoor and outdoor units wired correctly and connected securely?
- ⑤ Is the outdoor unit's refrigerant service valve open?

(c) Troubleshooting procedure (If the air conditioner does not run at all)

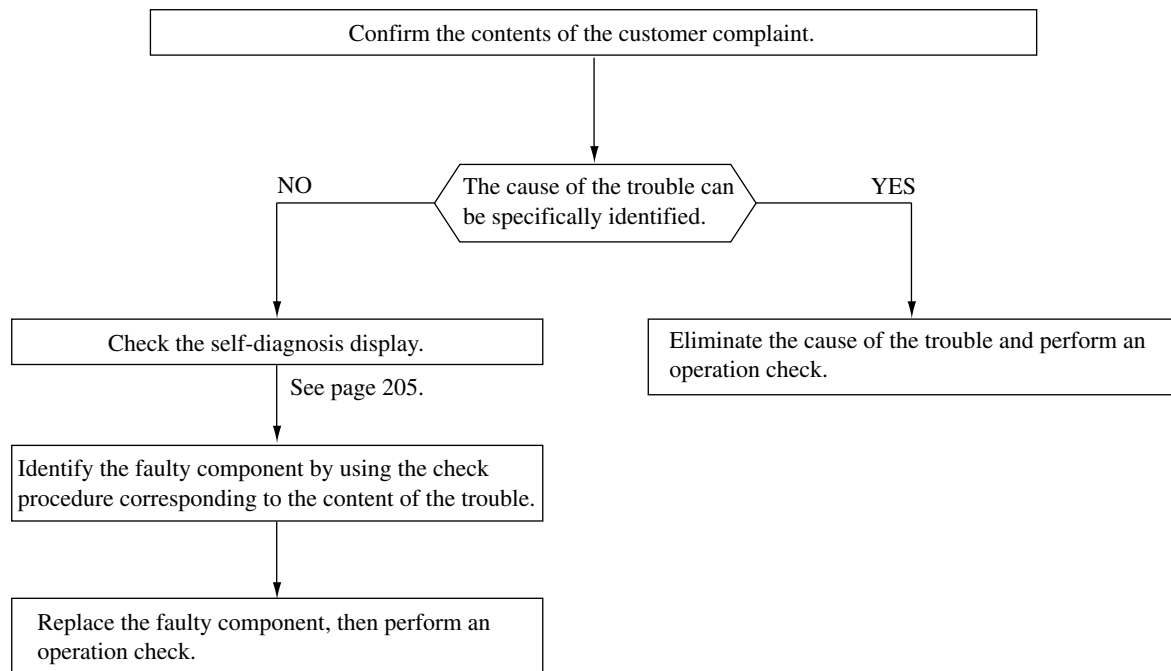
If the air conditioner does not run at all, diagnose the trouble using the following troubleshooting procedure. If the air conditioner is running but breaks down, proceed to troubleshooting step (d).

Important When all the following conditions are met, we say that the air conditioner will not run at all.

- ① The Run light does not light up.
- ② The flaps do not open.
- ③ The indoor unit fan motors do not run.
- ④ The self-diagnosis display does not function.



(d) Troubleshooting procedure (If the air conditioner runs)



Note (1) Even in cases where only intermittent stop data are generated, the air conditioning system is normal. However, if the same protective operation recurs repeatedly (3 or more times), it will lead to customer complaints. Judge the conditions in comparison with the contents of the complaints.

(e) Self-diagnosis table

When this air conditioner performs an emergency stop, the reason why the emergency stop occurred is displayed by the flashing of display lights. If the air conditioner is operated using the remote controller 3 minutes or more after the emergency stop, the trouble display stops and the air conditioner resumes operation. ⁽¹⁾

Indoor unit display panel		Outdoor unit LED	Description of trouble	Cause	Display (flashing) condition
Run light	Timer light				
ON	6 time flash	6 time flash	Error of signal transmission	• Defective power supply, Broken signal wire, defective in/outdoor unit boards	When there is no signal between the indoor unit's board and outdoor unit's board for 10 seconds or longer (when the power is turned on), or when there is no signal for 1 minute 50 seconds or longer (during operation)(the compressor is stopped).
1 time flash	ON	OFF	Heat exchanger sensor error	• Broken heat exchanger sensor wire, poor connector connection	When a heat exchanger sensor wire disconnection is detected while operation is stopped. (If a temperature of -20°C or lower is detected for 3 minutes, it is judged that the wire is disconnected.) (Not displayed during operation.)
2 time flash	ON	OFF	Room temperature sensor error	• Broken room temperature sensor wire, poor connector connection	When a room temperature sensor wire disconnection is detected while operation is stopped. (If a temperature of -20°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
6 time flash	ON	OFF	Indoor fan motor error	• Defective fan motor, poor connector connection	When conditions for turning the indoor unit's fan motor on exist during air conditioner operation, an indoor unit fan motor speed of 300 rpm or lower is measured for 30 seconds or longer. (The air conditioner stops.)
ON	5 time flash	5 time flash	Over heat of compressor	• Gas shortage, defective discharge pipe sensor, closed service valve	When the value of the discharge pipe sensor exceeds the set value. (The air conditioner stops.)
Keeps flashing	2 time flash	OFF	Outdoor heat exchanger sensor error	• Broken heat exchanger sensor wire, poor connector connection	When a sensor wire disconnection is detected while operation is stopped. (If a temperature of -64°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
Keeps flashing	1 time flash	OFF	Outdoor air temperature sensor error	• Broken outdoor air temp. sensor wire, poor connector connection	When an outdoor air temperature sensor wire disconnection is detected while operation is stopped. (If a temperature of -64°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
Keeps flashing	4 time flash	OFF	Discharge pipe sensor error	• Broken discharge pipe sensor wire, poor connector connection	After the compressor has operated for 9 minutes continuously, if there is a disconnected signal for the discharge pipe temperature sensor detected -64°C for 15 seconds.
ON	2 time flash	OFF	Abnormality of outdoor unit	• Broken compressor wire • Broken discharge pipe sensor wire, poor connector connection • Compressor blockage	Cooling operation When the indoor heat exchanger temperature does not fall to 25°C or below for 40 minutes after 5 minutes have elapsed since the compressor operation start. Heating operation ① The indoor heat exchanger temperature < 5°C for 5 minutes and more ② 5°C ≤ the indoor heat exchanger temperature < 30°C for 40 minutes and more

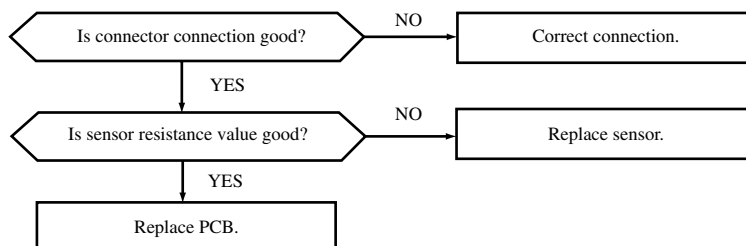
Notes (1) The air conditioner cannot be restarted using the remote controller for 3 minutes after operation stops.

(2) The outdoor unit's power supply is cut off 3 minutes after an abnormal stop, so the outdoor unit LED cannot be checked (52C OFF).

(f) Inspection procedures corresponding to detail of trouble

Sensor error

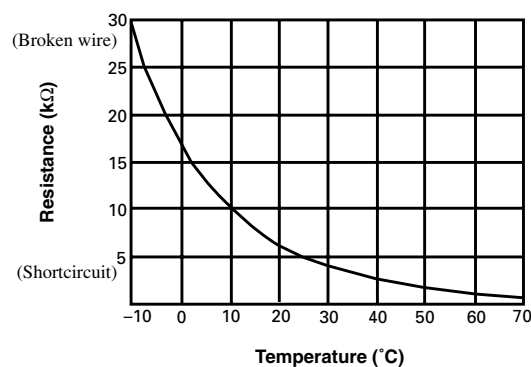
[Broken sensor wire, connector poor connection]



◆ Discharge pipe sensor temperature characteristics

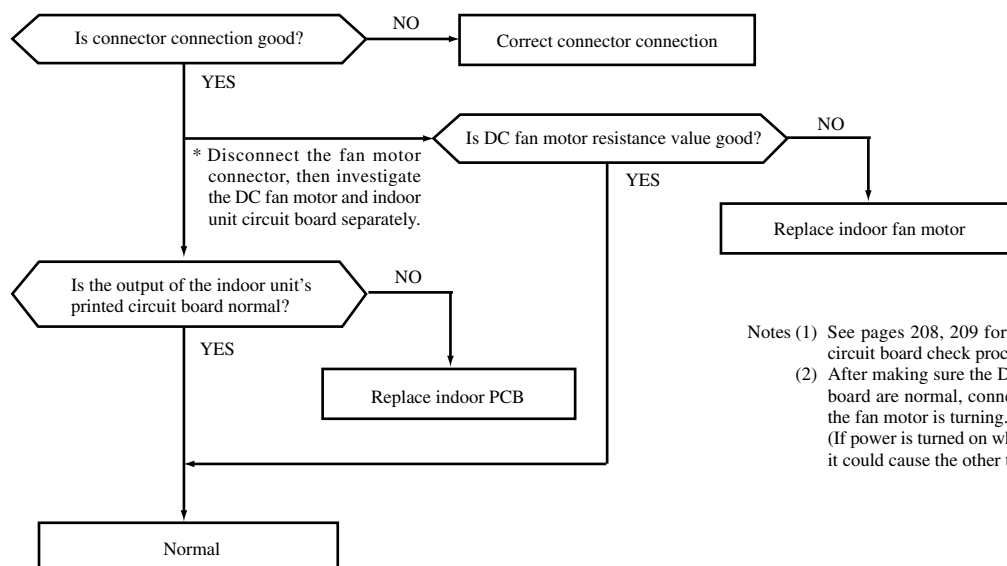
Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
0	164	70	8.7
5	127	75	7.3
10	99	80	6.2
15	78	85	5.3
20	62	90	4.5
25	50	95	3.9
30	40	100	3.3
35	32	105	2.9
40	26	110	2.5
45	21	115	2.2
50	17	120	1.9
55	14	125	1.6
60	12	130	1.4
65	10	135	1.3

◆ Sensor temperature characteristics (Room temp., indoor unit heat exchanger temp., outdoor unit heat exchanger temp., outdoor air temp.)



Indoor fan motor error

[Defective fan motor, connector poor connection, defective PCB]

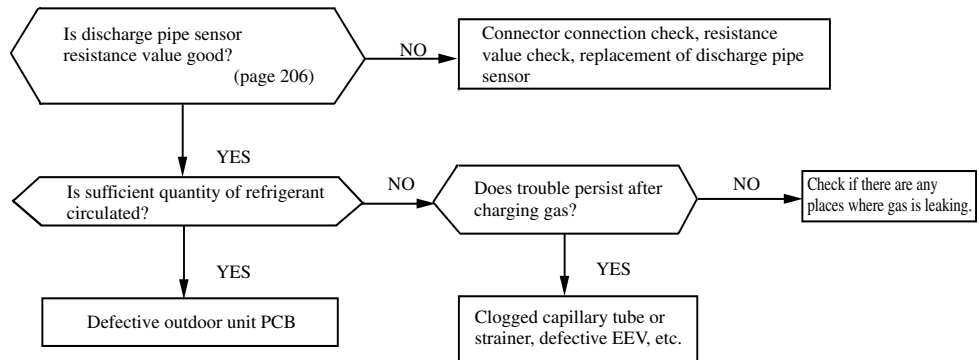


Notes (1) See pages 208, 209 for the DC fan motor and indoor unit circuit board check procedure.

(2) After making sure the DC fan motor and indoor unit circuit board are normal, connect the connectors and confirm that the fan motor is turning.
(If power is turned on while one or the other is broken down, it could cause the other to break down also.)

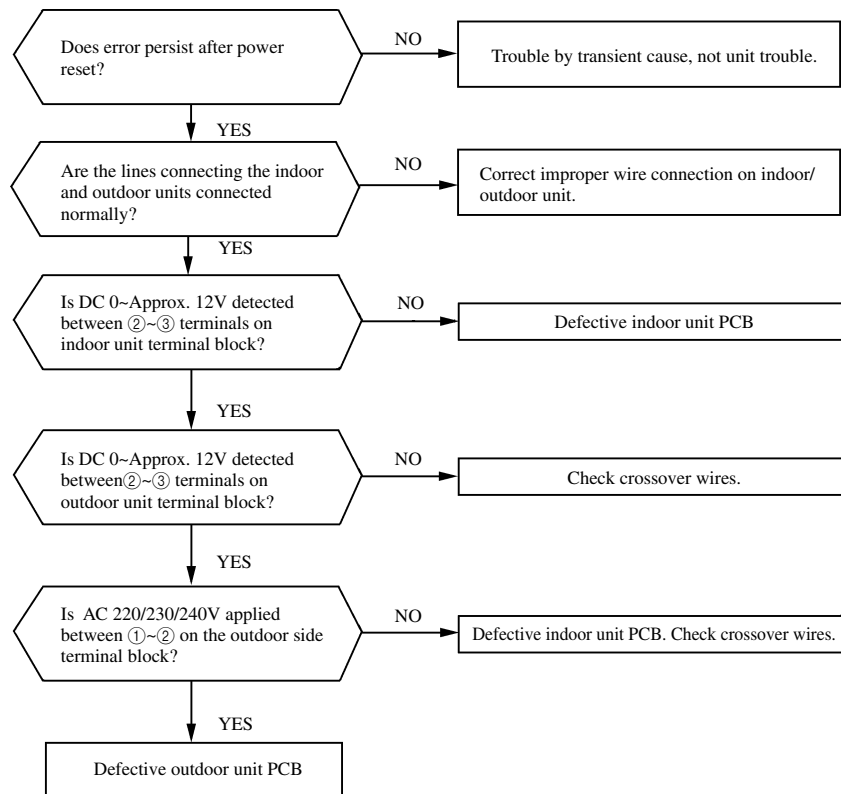
Over heat of compressor

[Gas shortage, defective discharge pipe sensor]



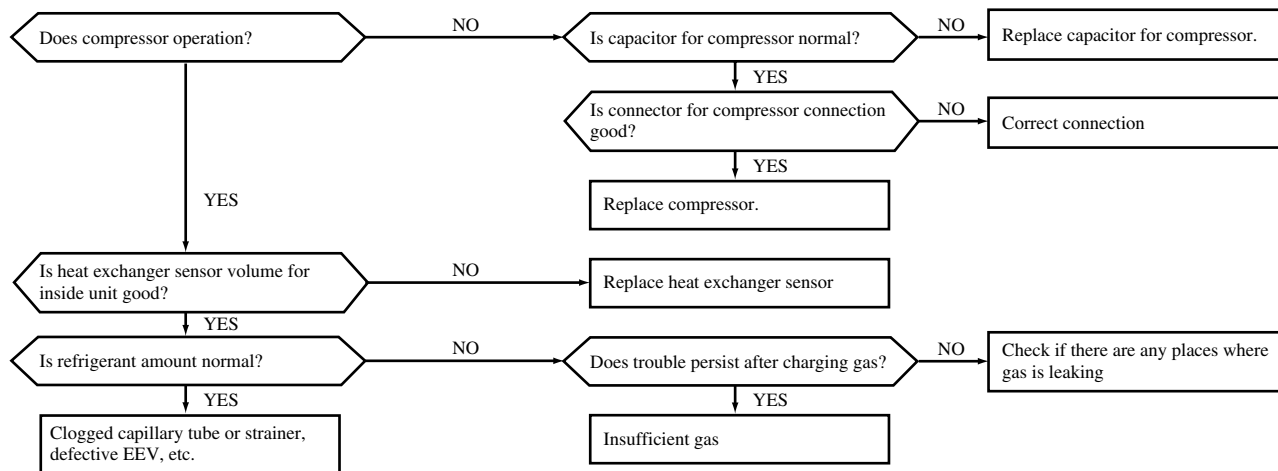
Error of signal transmission

[Wiring error including power cable, defective indoor/outdoor unit PCB]



Abnormality of outdoor unit

[Compressor malfunction of insufficient gas (refrigerant)]



(g) Phenomenon observed after shortcircuit, wire breakage on sensor.

(i) Indoor unit

Sensor	Operation mode	Phenomenon	
		Shortcircuit	Broken wire
Room temperature sensor	Cooling	Release of continuous compressor operation command	Continuous compressor operation command is not released.
	Heating	Continuous compressor operation command is not released.	Release of continuous compressor operation command
Heat exchanger sensor	Cooling	Compressor stop. (Abnormality of outdoor unit)	Continuous compressor operation command is not released. (Anti-frosting)
	Heating	High pressure control mode	Hot keep (Indoor fan stop)

(ii) Outdoor unit

Sensor	Operation mode	Phenomenon	
		Shortcircuit	Broken wire
Heat exchanger sensor	Cooling	System can be operated normally.	System can be operated normally.
	Heating	Defrosting is not performed.	Defrosting is performed for 10 minutes at approx. 35 minutes.
Outdoor air temperature sensor	Cooling	System can be operated normally.	System can be operated normally.
	Heating	Defrosting is not operated.	Defrosting is performed for 10 minutes at approx. 35 minutes.
Discharge pipe sensor	All modes	Compressor overload protection is disabled. (Can be operated.)	Compressor stop

(h) Checking the indoor electrical equipment

(i) Indoor unit circuit board check procedure

- Turn off the power.
 - Disconnect the wires connected between the indoor and outdoor units at the terminal block. (They can be disconnected at either the indoor or outdoor unit's terminal block.)
 - Turn on the power.
 - The voltage between ① and ② on the terminal block should not be AC 220-240 V.
 - Press the unit's ON/OFF button for 5 seconds or longer (a beep which indicates receiving will be emitted). Then check the following items.
 - The indoor unit's fan motor runs.
 - The run light lights up.
 - There should be voltage (AC 220-240 V) between terminals ① and ② on the terminal block.
With the analog tester set in the DC 30 V range, if the voltage at ② (+) and ③ (-) is measured, the needle oscillates at about 12V.
 - It is possible to run and stop the unit using the remote controller. (The hot keep function is activated.)
- If operation is as described above, the indoor unit's board is normal.

Notes (1) Since the communication timing signal is transmitted only when the 52C is turned ON, check it under the operating condition.

(2) Check the voltage on the terminal block.

- Power supply : Between ①-② (AC 220-240V)
- Signal : Between ②-③ (Changing between DC 0-Approx. 12V)

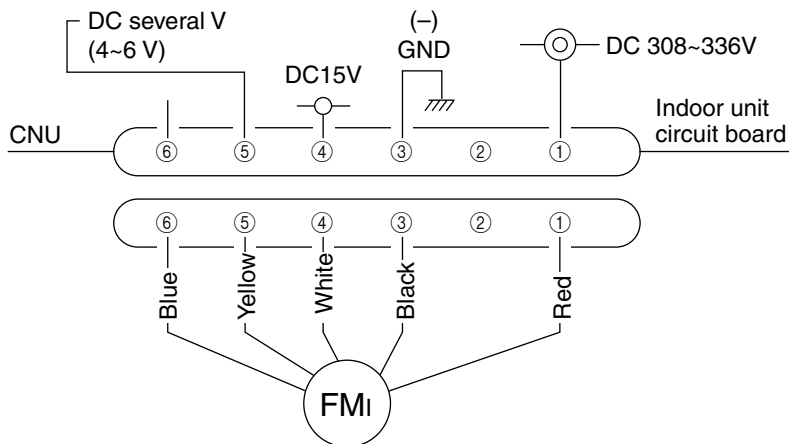
(ii) Indoor unit fan motor check procedure

This is a diagnostic procedure for determining if the indoor unit's fan motor or the circuit board is broken down.

1) Indoor unit printed circuit board output check

- Turn off the power.
- Remove the front panel, then disconnect the fan motor lead wire connector.
- Turn on the power. If the unit operates when the ON/OFF button is pressed, if trouble is detected after the voltages in the following figure are output for approximately 30 seconds, it means that the circuit board is normal and the fan motor is broken down.

If the voltages in the following figure are not output at connector pins No. ①, ④ and ⑤, the indoor unit's circuit board has failed and the fan motor is normal.



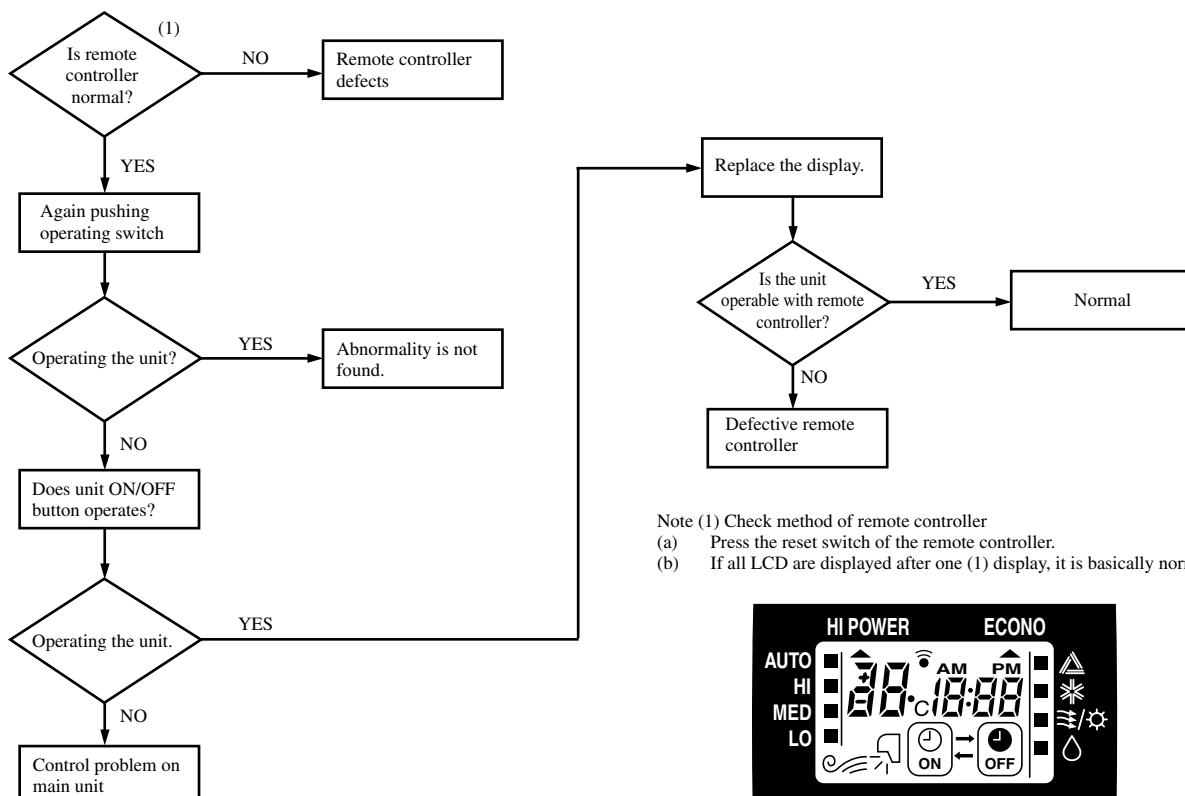
2) DC Fan motor resistance check

Measuring Point	Resistance when Normal
① – ③ (Red – Black)	25 MΩ or higher
④ – ③ (White – Black)	30 kΩ or higher

Notes (1) Remove the fan motor and measure it without power connected to it.

(2) If the measured value is below the value when the motor is normal, it means that the fan motor is faulty.

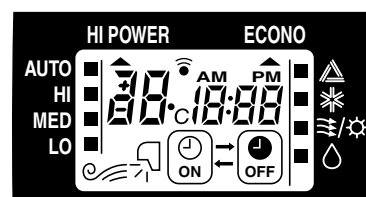
(i) How to make sure of remote controller



Note (1) Check method of remote controller

(a) Press the reset switch of the remote controller.

(b) If all LCD are displayed after one (1) display, it is basically normal.



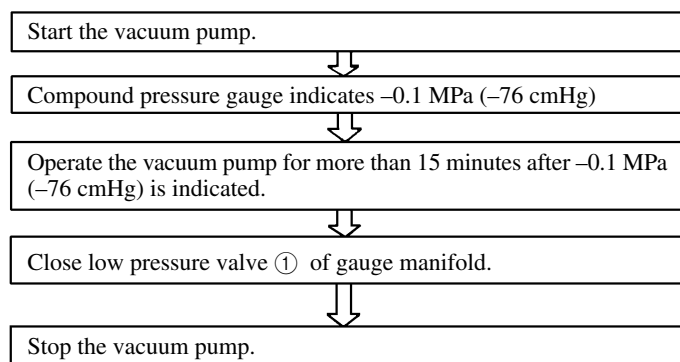
(2) Servicing

(a) Evacuation

The evacuation is an procedure to purge impurities.....noncondensable gas, air, moisture from the refrigerant equipment by using a vacuum pump. Since the refrigerant R410A is very insoluble in water, even a small amount of moisture left in the refrigerant equipment will freeze, causing what is called water clogging.

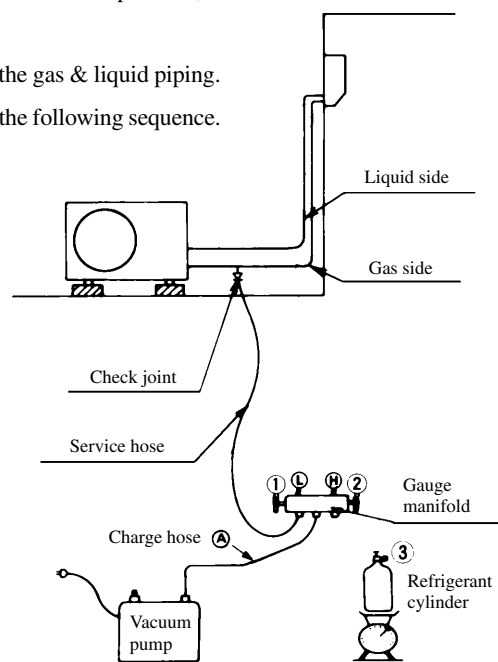
- Evacuation procedure

- Check to ensure that there is no internal pressure in the unit. If there is an internal pressure, it should be relieved through the check joint.
- Connect the service hoses of the gauge manifold to the check joint of the gas & liquid piping.
- Connect a vacuum pump to the charge hose ①. Repeat evacuation in the following sequence.



Notes

- (1) Do not use the refrigerant pressure to expel air.
- (2) Do not use the compressor for evacuation.
- (3) Do not operate the compressor in the vacuum condition.



(b) Refrigerant charge

- Discharge refrigerant entirely from the unit and evacuate the unit.
Note: Addition of refrigerant without evacuation is unreasonable, because it will result in low charge or overcharge.
- Keep the gauge manifold and connect a refrigerant cylinder to the unit.
- Record the weight of the refrigerant cylinder on the balance. This is necessary for making sure of the charged refrigerant amount.
- Purge air from the charge hose ①
Firstly loose the connecting portion of the charge hose ① at the gauge manifold side and open the valve ③ for a few seconds, and then immediately retighten it after observing that gas is blow out from the loosened portion.
- Open the valve ① and ③ after discharging air from the charge hose ①, then the liquid refrigerant begins flowing from the cylinder into the unit. Be sure to erect the refrigerant cylinder upright to let liquid refrigerant flow into the unit.
- When refrigerant has been charged into the system to some extent, refrigerant flow becomes stagnant, when that happens, start the compressor in cooling cycle until the unit is filled with refrigerant to the specified weight.
- Making sure of the refrigerant amount, close the valve ③
- Disconnect the charge hose from the unit. Cover the valve ports of the refrigerant piping with caps and tighten them securely.
- Check for gas leakage applying a gas leak detector along the piping line.
- Start the air conditioner and make sure of its operating condition.....high side and low side pressures and temperature difference between return air and supply air.

2.2.7 REFRIGERANT PIPING INSTALLATION/SERVICING MANUAL FOR AIR CONDITIONERS USING R410A

This is same as chapter 1.1.7 Refer to page 55.

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2.3.1 GENERAL INFORMATION

(1) Specific features

The “MITSUBISHI HEAVY INDUSTRIES, LTD.” room air-conditioner: SRK series are of split and wall mounted type and the unit consists of indoor unit and outdoor unit with refrigerant precharged in factory. The indoor unit is composed of room air cooling or heating equipment with operation control switch and the outdoor unit is composed of condensing unit with compressor.

(a) Remote control flap & louver

The flap & louver can be automatically controlled by operating wireless remote control.

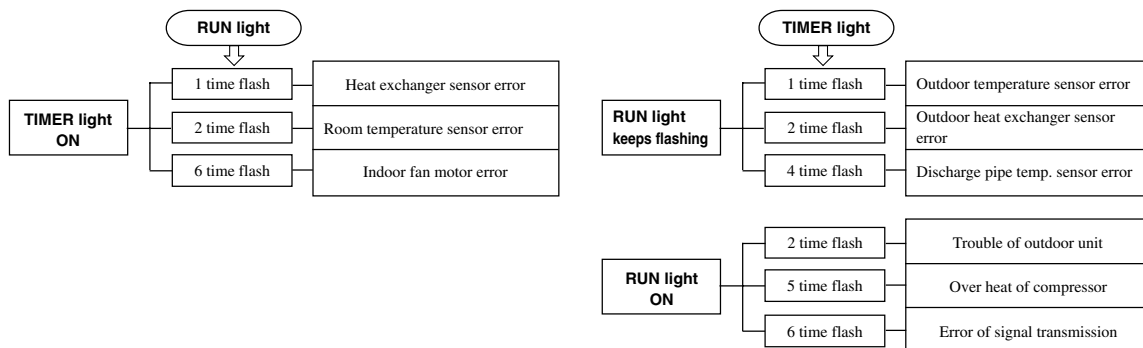
- Flap swing : The flaps swing up and down successively.
- Louver swing : The louvers swing left and right successively.
- Multi-directional Air Flow : Activating both up/down air swing and left/right air swing at the same time results in a multi-directional air flow.
- Memory flap : Once the flap & louver position is set, the unit memorizes the position and continues to operate at the same position from the next time.

(b) Automatic operation

When the remote control switch is set on “auto(☉)”, it will either automatically decide operation mode such as cooling, heating and thermal dry, or operate in the operation mode before it has been turned to automatic control.

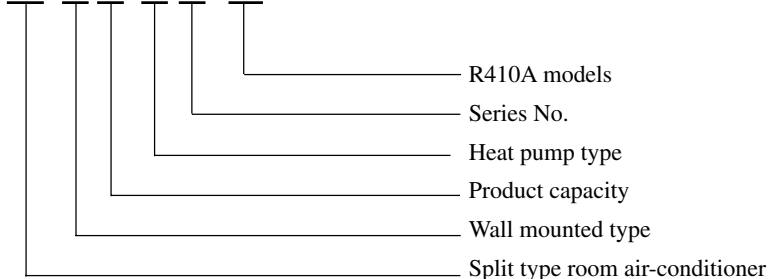
(c) Self diagnosis function

- We are constantly trying to do better service to our customers by installing such judges that show abnormality of operation as follows.



(2) How to read the model name

Example : **SR K 63 H E - S1**



2.3.2 SELECTION DATA

(1) Specifications

Model SRK63HE-S1 (Indoor unit)
SRC63HE-S1 (Outdoor unit)

(220/230/240V)

Item				Model	SRK63HE-S1	SRC63HE-S1
Cooling capacity ⁽¹⁾				W	6300	
Heating capacity ⁽¹⁾				W	6700	
Power source					1 Phase, 220-240V, 50Hz	
Operation data ^{(1) (2)}	Cooling input			kW	2.19	
	Running current (Cooling)			A	10.9/10.5/10.0	
	Heating input			kW	1.85	
	Running current (Heating)			A	9.2/8.8/8.5	
	Inrush current			A	53	
	COP				Cooling: 2.88 Heating: 3.62	
	Noise level	Cooling	Sound level	dB	Hi 44, Me 40, Lo 37	49
			Power level		59	65
Heating		Sound level	Hi 45, Me 41, Lo 37		49	
		Power level	60		65	
Exterior dimensions Height × Width × Depth				mm	318 × 1098 × 248	640 × 850 × 290
Color					Yellowish white	Stucco white
Net weight				kg	15	47
Refrigerant equipment Compressor type & Q'ty					—	RM-B5125MNE5 (Rotary type) × 1
Motor				kW	—	1.9
Starting method					—	Line starting
Heat exchanger					Slit fins & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control					Capillary tubes + Electric expansion valve	
Refrigerant ⁽³⁾				kg	R410A 1.5 (Pre-Charged up to the piping length of 15m)	
Refrigerant oil				ℓ	0.7 (MA68)	
Deice control					Microcomputer control	
Air handling equipment Fan type & Q'ty					Tangential fan × 1	Propeller fan × 1
Motor				W	46	43
Air flow (at High)			(Cooling)	CMM	18	42
			(Heating)		20.5	42
Air filter, Q'ty					Polypropylene net (washable) × 2	—
Shock & vibration absorber					—	Cushion rubber (for compressor)
Electric heater					—	—
Operation control Operation switch					Wireless-Remote control	—
Room temperature control					Microcomputer thermostat	—
Pilot lamp					RUN (Green), TIMER (Yellow), HI POWER (Green), ECONO (Orange)	
Safety equipment					Compressor: overheat protection, Heating overload protection (High pressure control), Frost protection, Serial signal error protection, Indoor fan motor error protection	
Refrigerant piping	O.D			mm (in)	Liquid line: ϕ6.35 (1/4") Gas line: ϕ12.7 (1/2")	
	Connecting method				Flare connecting	
	Attached length of piping				Liquid line: 0.70m Gas line: 0.63m	—
	Insulation				Necessary (Both sides)	
Drain hose					Connectable	
Power source supply					Terminal block (Screw fixing type)	
Connection wiring	Size × Core number				1.5 mm ² × 4 cores (Including earth cable)	
	Connecting method				Terminal block (Screw fixing type)	
Accessories (included)					Mounting kit, Clean filter (Natural enzyme filter × 1, Photocatalytic washable deodorizing filter × 1)	
Optional parts					Wired-Remote control	

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS C9612
Heating	20°C	—	7°C	6°C	ISO-T1, JIS C9612

The piping length is 7.5m.

(2) The operation data are applied to the 220/230/240V districts respectively.

(3) The refrigerant quantity to be charged includes the refrigerant in 15 m connecting piping.

(Purging is not required even in the short piping.)

If the piping length is longer, when it is 15 to 25m, add 20g refrigerant per meter.

Model SRK71HE-S1 (Indoor unit)
SRC71HE-S1 (Outdoor unit)

(220/230/240V)

Item				Model	SRK71HE-S1	SRC71HE-S1
Cooling capacity ⁽¹⁾				W	7100	
Heating capacity ⁽¹⁾				W	7500	
Power source					1 Phase, 220-240V, 50Hz	
Operation data ^{(1) (2)}	Cooling input			kW	2.21	
	Running current (Cooling)			A	11.0/10.6/10.1	
	Heating input			kW	2.07	
	Running current (Heating)			A	10.3/9.9/9.5	
	Inrush current			A	49	
	COP				Cooling: 3.21 Heating: 3.62	
	Noise level	Cooling	Sound level	dB	Hi 45, Me 41, Lo 38	54
			Power level		59	69
		Heating	Sound level		Hi 46, Me 41, Lo 38	55
Power level			60		70	
Exterior dimensions Height × Width × Depth				mm	318 × 1098 × 248	750 × 880 × 340
Color					Yellowish white	Stucco white
Net weight				kg	15	68
Refrigerant equipment Compressor type & Q'ty					—	5JS270DAA01
Motor				kW	—	1.8
Starting method					—	Line starting
Heat exchanger					Slit fins & inner grooved tubing	Straight fin & inner grooved tubing
Refrigerant control					Capillary tubes + Electric expansion valve	
Refrigerant ⁽³⁾				kg	R410A 2.0 (Pre-charged up to the piping length of 15m)	
Refrigerant oil				ℓ	1.13 (RB68A or Freol Alpha 68M)	
Deice control					Microcomputer control	
Air handling equipment Fan type & Q'ty					Tangential fan × 1	Propeller fan × 1
Motor				W	46	85
Air flow (at High)			(Cooling)	CMM	19	60
			(Heating)		21	60
Air filter, Q'ty					Polypropylene net (washable) × 2	—
Shock & vibration absorber					—	Cushion rubber (for compressor)
Electric heater					—	—
Operation control Operation switch					Wireless-Remote control	—
Room temperature control					Microcomputer thermostat	—
Pilot lamp					RUN (Green), TIMER (Yellow), HI POWER (Green), ECONO (Orange)	
Safety equipment					Compressor: overheat protection, Heating overload protection (High pressure control), Frost protection, Serial signal error protection, Indoor fan motor error protection	
Refrigerant piping	O.D			mm (in)	Liquid line: φ6.35 (1/4") Gas line: φ15.88 (5/8")	
	Connecting method				Flare connecting	
	Attached length of piping				Liquid line: 0.70m Gas line : 0.63m	—
	Insulation				Necessary (Both sides)	
Drain hose					Connectable	
Power source supply					Terminal block (Screw fixing type)	
Connection wiring	Size × Core number				1.5 mm ² × 4 cores (Including earth cable)	
	Connecting method				Terminal block (Screw fixing type)	
Accessories (included)					Mounting kit, Clean filter (Natural enzyme filter × 1, Photocatalytic washable deodorizing filter × 1)	
Optional parts					Wired-Remote control	

Notes (1) The data are measured at the following conditions.

Operation	Item	Indoor air temperature		Outdoor air temperature		Standards
		DB	WB	DB	WB	
Cooling		27°C	19°C	35°C	24°C	ISO-T1, JIS C9612
Heating		20°C	—	7°C	6°C	ISO-T1, JIS C9612

The piping length is 7.5m.

- (2) The operation data are applied to the 220/230/240V districts respectively.
(3) The refrigerant quantity to be charged includes the refrigerant in 15 m connecting piping.
(Purging is not required even in the short piping.)
If the piping length is longer, when it is 15 to 25m, add 25g refrigerant per meter.

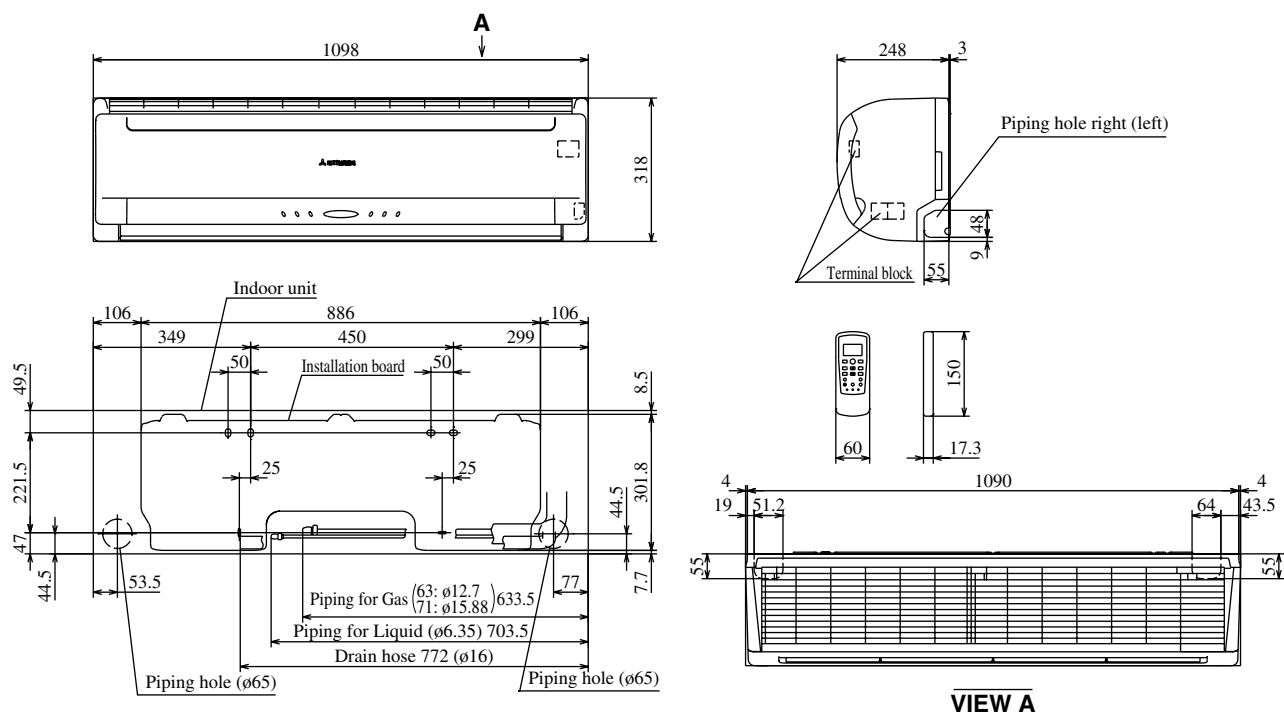
(2) Range of usage & limitations

Item	Models	All models
Indoor return air temperature (Upper, lower limits)		Cooling operation : Approximately 21 to 32°C Heating operation : Approximately 15 to 30°C
Outdoor air temperature (Upper, lower limits)		Cooling operation : Approximately 21 to 43°C Heating operation : Approximately -5 to 21°C
Refrigerant line (one way) length		Max. 25m
Vertical height difference between outdoor unit and indoor unit		Max. 15m
Power source voltage		Rating $\pm$ 10%
Voltage at starting		Min. 85% of rating
Frequency of ON-OFF cycle		Max. 10 times/h
ON and OFF interval		Max. 3 minutes

(3) Exterior dimensions

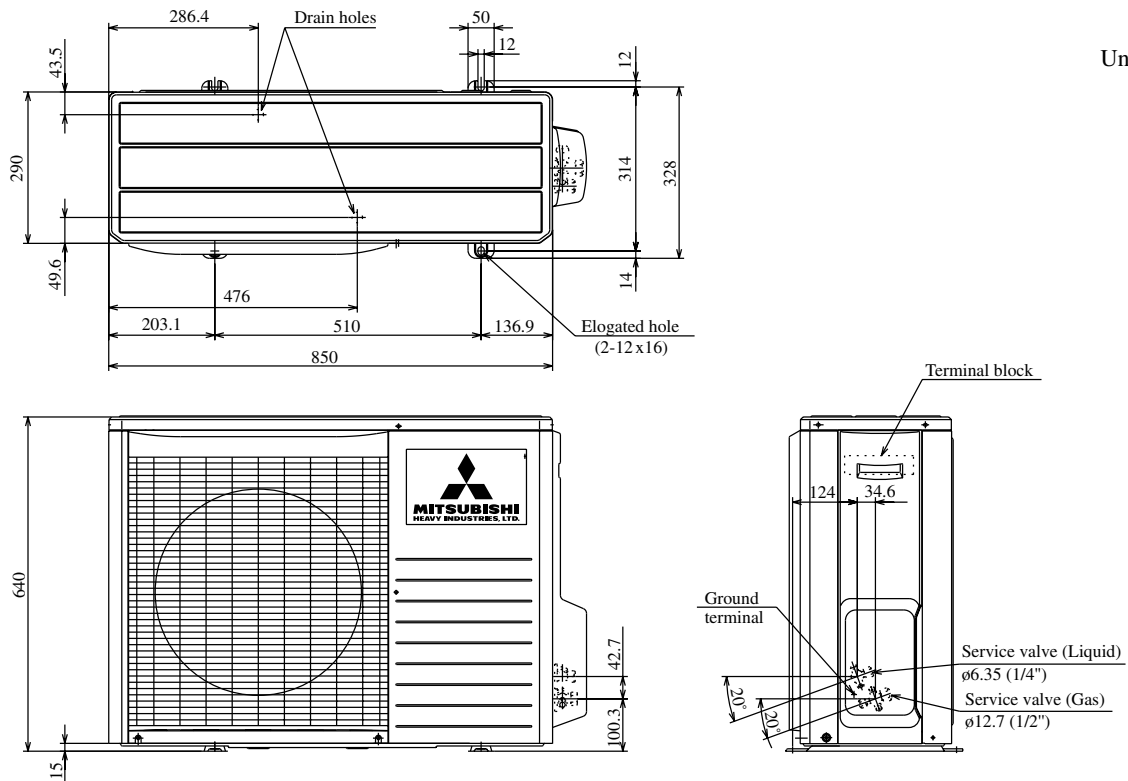
(a) Indoor unit
Models SRK63HE-S1, 71HE-S1

Unit: mm



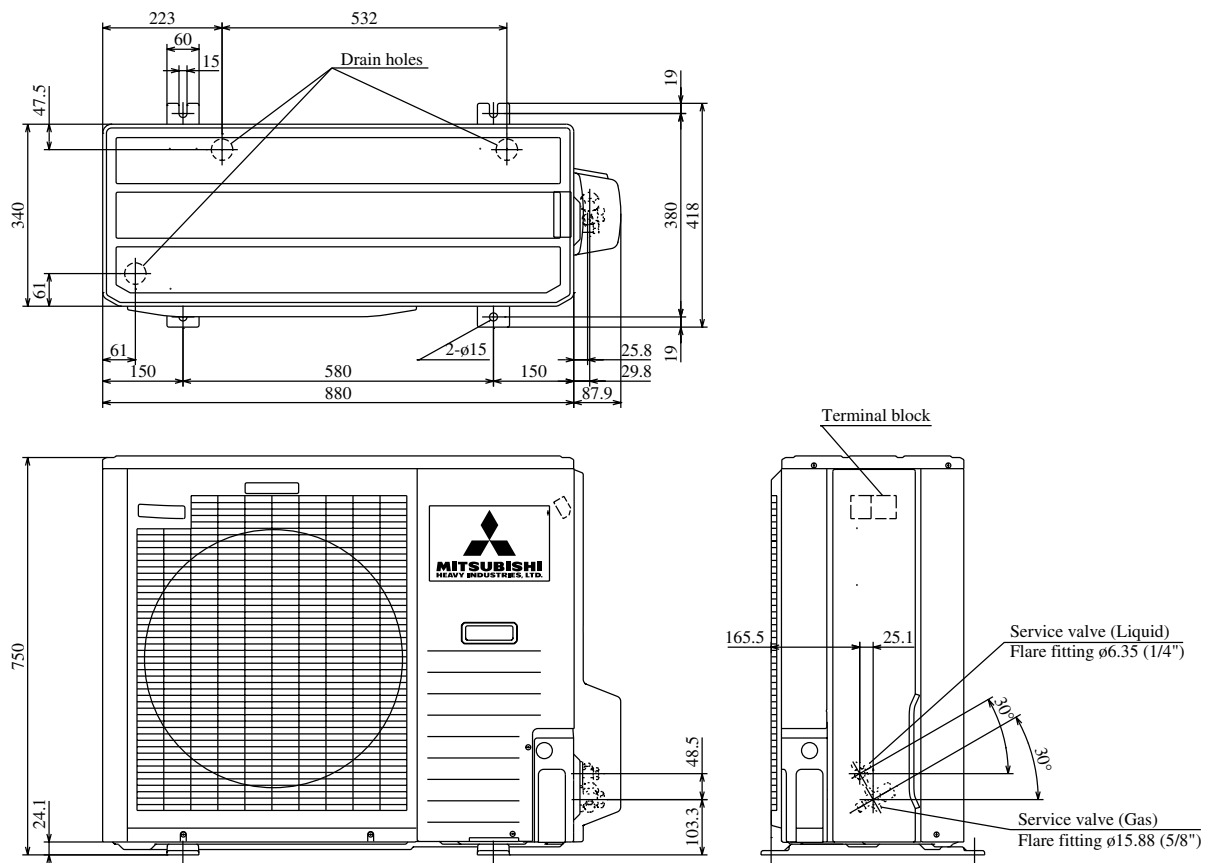
(b) Outdoor unit
Model SRC63HE-S1

Unit: mm



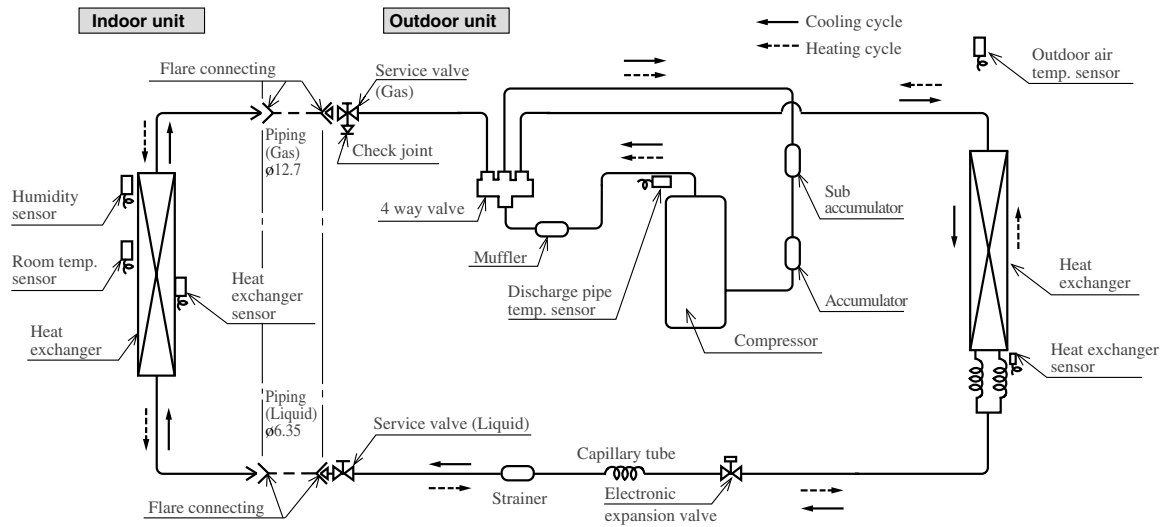
Model SRC71HE-S1

Unit: mm

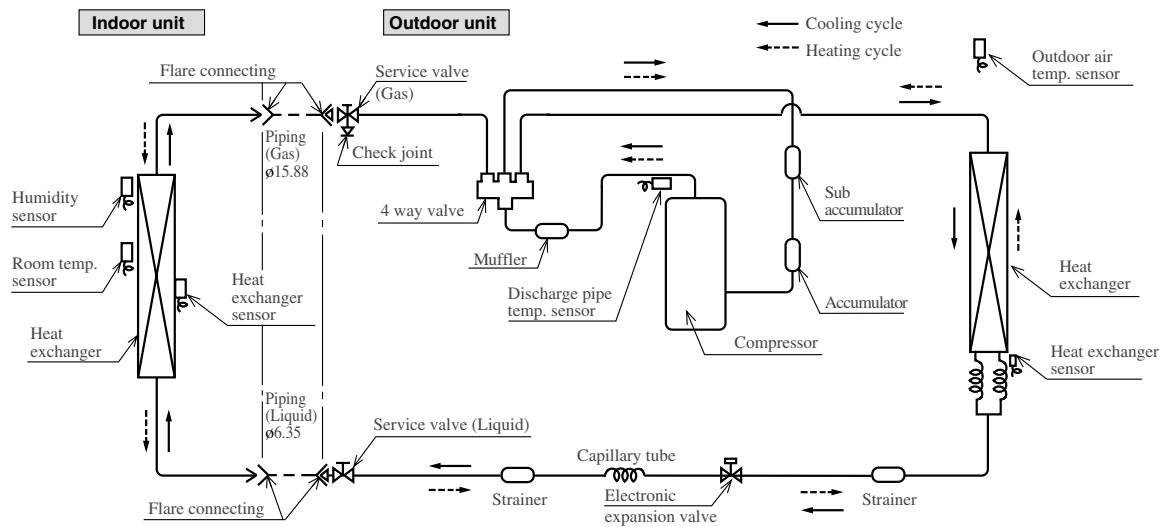


(4) Piping system

Model SRK63HE-S1



Model SRK71HE-S1

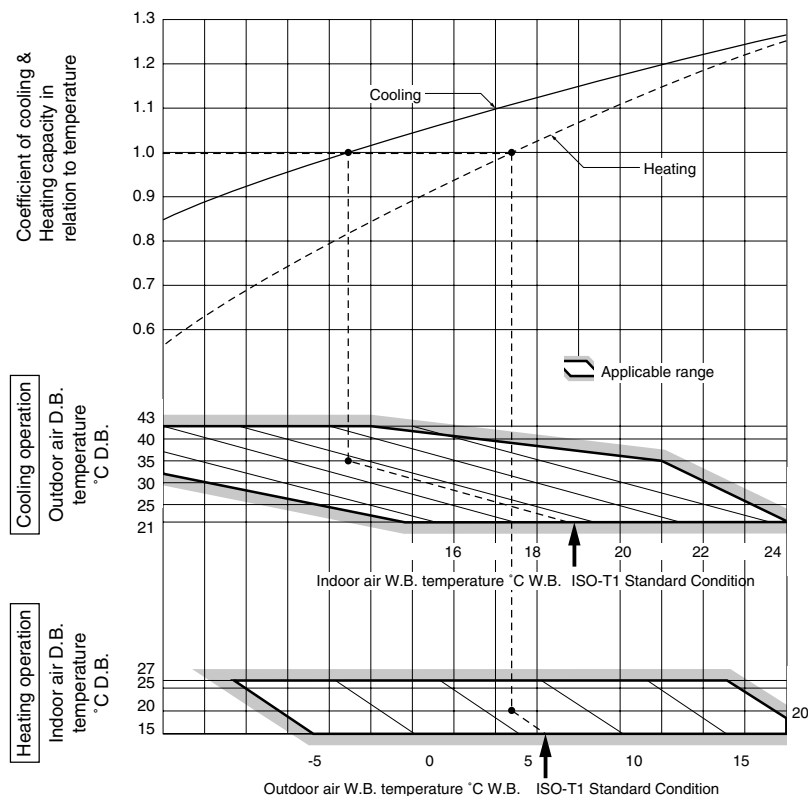


(5) Selection chart

Correct the cooling and heating capacity in accordance with the conditions as follows. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown on specification × Correction factors as follows.

(a) Coefficient of cooling and heating capacity in relation to temperatures



(b) Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way piping length between the indoor and outdoor units.

Piping length [m]	7	10	15	20	25
Cooling	1.0	0.99	0.975	0.965	0.95
Heating	1.0	1.0	1.0	1.0	1.0

(c) Correction relative to frosting on outdoor heat exchanger during heating

In additions to the foregoing corrections (a), (b) the heating capacity needs to be adjusted also with respect to the frosting on the outdoor heat exchanger.

Air inlet temperature of outdoor unit in °CWB	-5	-3	-1	1	3	5
Adjustment coefficient	0.91	0.88	0.86	0.87	0.92	1.00

How to obtain the cooling and heating capacity

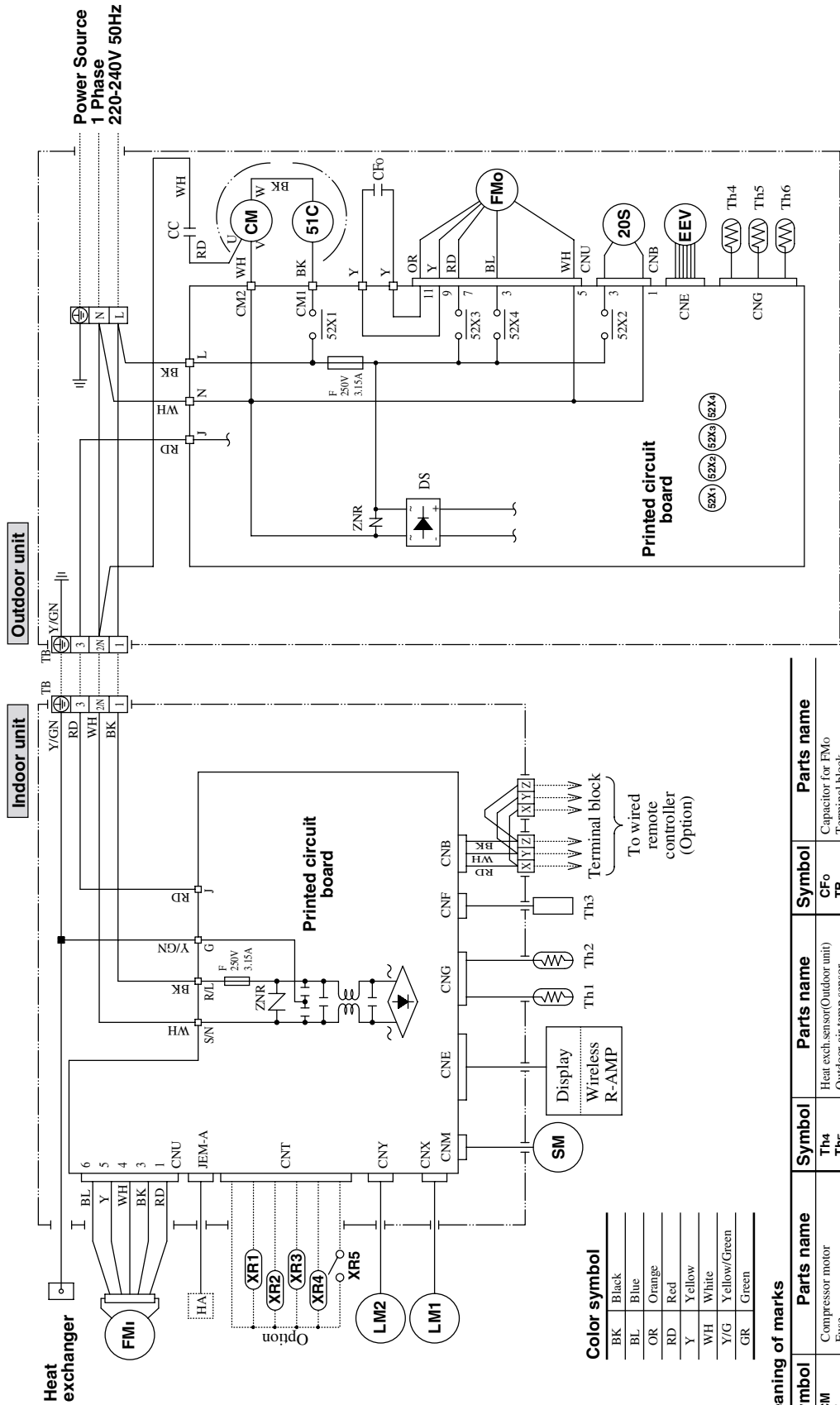
Example : The net cooling capacity of the model SRK63HE-S1 with the piping length of 15m, indoor wet-bulb temperature at 19.0°C and outdoor dry-bulb temperature 35°C is Net cooling capacity =

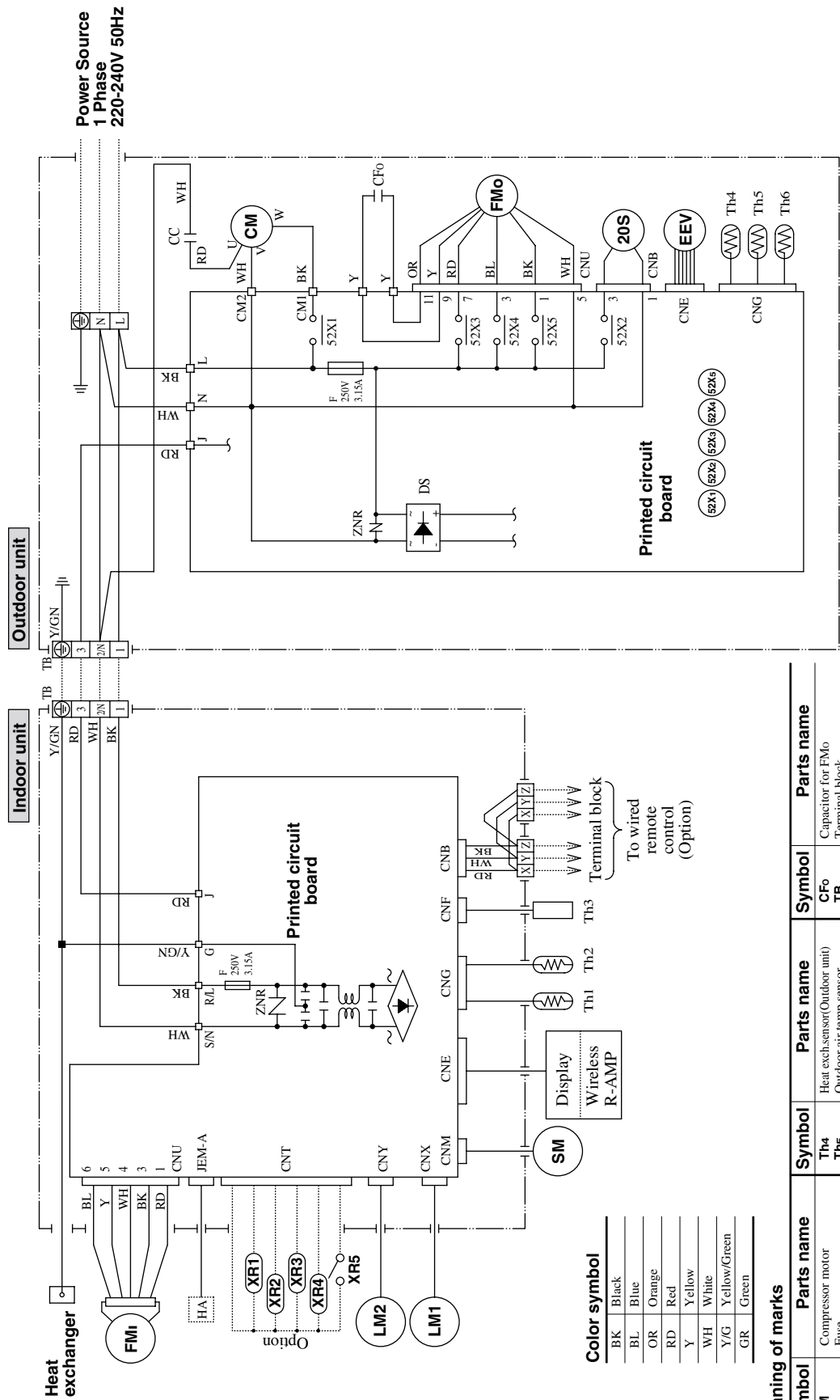
$$\begin{array}{ccccccc}
 \uparrow & & \uparrow & & \uparrow & & \\
 \text{SRK63HE-S1} & & \text{Length 15m} & & \text{Factor by air temperatures} & & \\
 6300 & \times & 0.975 & \times & 1.0 & = & 6143\text{W}
 \end{array}$$

2.3.3 ELECTRICAL DATA

(1) Electrical wiring

Model SRK63HE-S1





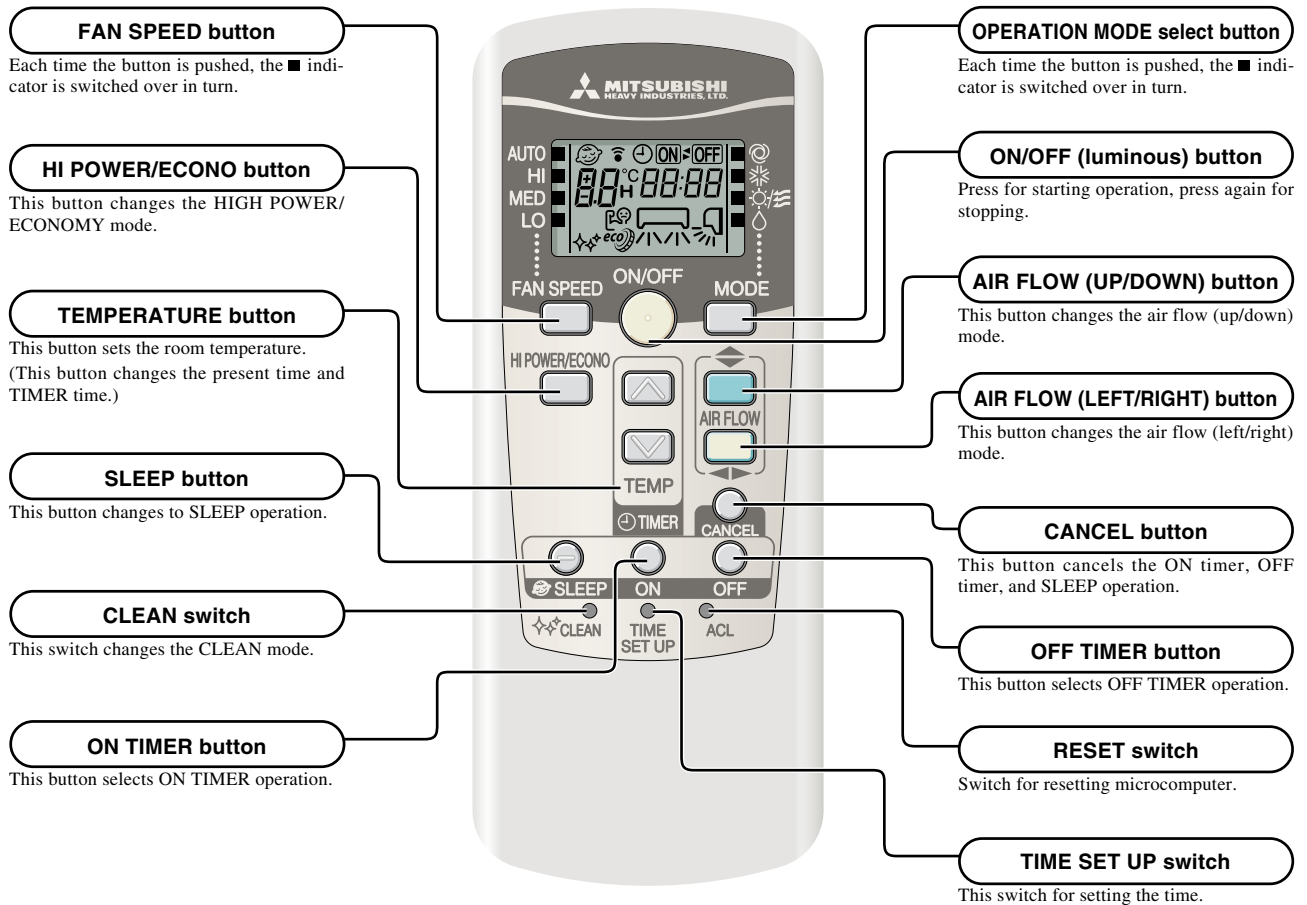
2.3.4 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

(1) Operation control function by remote control switch

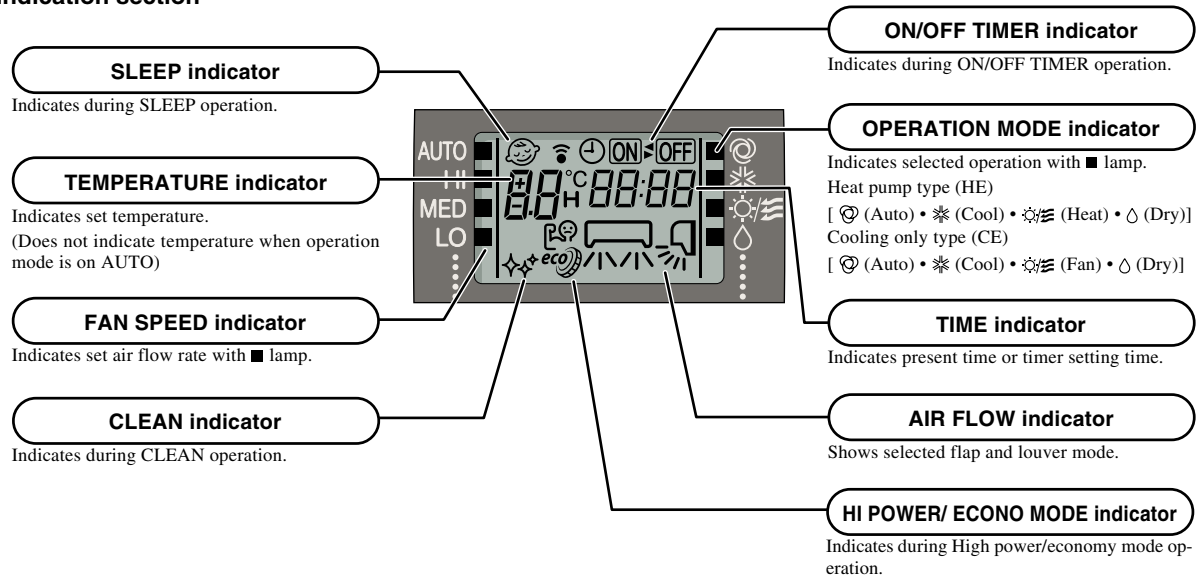
(a) Wireless remote control

Models All models

◆ Operation section



◆ Indication section



(b) Wired remote control (Optional parts)

The figure below shows the remote control with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation.

Characters displayed with dots in the liquid crystal display area are abbreviated.

Notes (1) The SRK models don't support the switches and functions displayed in [].

Pull the cover downward to open it.

Central control display

Displayed when the air conditioning system is controlled by the option controller.

Timer operation display

Displays the settings related to timer operation.

Temperature setting switches

These switches are used to set the temperature of the room.

TIMER switch

This switch is used to select a timer mode.
(The comfortable timer or sleep operation cannot be selected.)

Timer setting switches

These switches are used to set the timer mode and time.

[GRILL switch]

This switch has no function.
When this switch is pressed, INVALID OPER (Invalid Operation) is displayed, but it does not mean a failure.

AIR CON No. (Air conditioning system No.) switch

Displays the number of the connected air conditioning system.
("00" appears.)

[CHECK switch]

This switch is used at servicing.

[TEST switch]

This switch is used during test operation.

[Vent indicator]

Indicates operation in the ventilation mode.

Weekly timer display

Displays the settings of the weekly timer.

Operation setting display area

Displays setting temperature, airflow volume, operation mode and operation message.

Operation/Check indicator light

During operation: Lit in green
In case of error: Flashing in red

Operation/Stop switch

This switch is used to operate and stop the air conditioning system.
Press the switch once to operate the system and press it once again to stop the system.

MODE switch

This switch is used to switch between operation modes.
(The clean operation cannot be selected.)

FAN SPEED switch

This switch is used to set the airflow volume.
(AUTO, HI POWER or ECONO cannot be selected.)

[VENT switch]

Switch that operates the connected ventilator.

LOUVER switch

This switch is used to operate/stop the swing louver.
(UP/down swing only)

SET switch

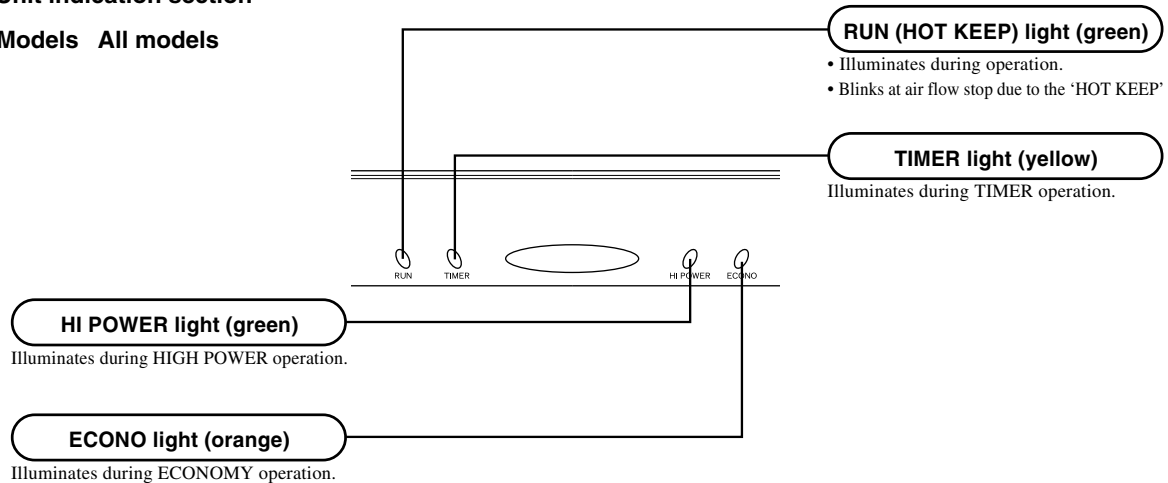
This switch is used to apply the timer operation setting.
This switch is also used to make silent mode operation settings.

[RESET switch]

Press this switch while making settings to go back to the previous operation.
This switch is also used to reset the "FILTER CLEANING" message display.
(Press this switch after cleaning the air filter.)

* If you press any of the switches above and "INVALID OPER" is display, the switch has no function.
But it does not mean a failure.

Models All models



(2) Unit ON/OFF button

When the remote control batteries become weak, or if the remote control is lost or malfunctioning, this button may be used to turn the unit on and off.

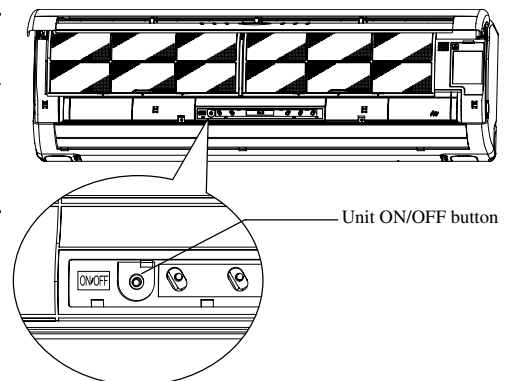
(a) Operation

Push the button once to place the unit in the automatic mode. Push it once more to turn the unit off.

(b) Details of operation

The unit will go into the automatic mode in which it automatically determines, from room temperature (as detected by sensor), whether to go into the cooling, thermal dry or heating modes.

Function Operation mode	Room temperature setting	Fan speed	Flap	Timer switch
Cooling	About 24°C	Auto	Auto	Continuous
Thermal dry	About 24°C			
Heating	About 26°C			



(3) Power blackout auto restart function

(a) Power blackout auto restart function is a function that records the operational status of the air-conditioner immediately prior to it

being switched off by a power cut, and then automatically resumes operations at that point after the power has been restored.

(b) The following settings will be cancelled:

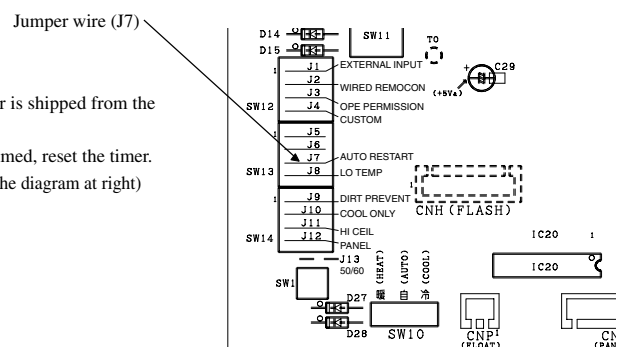
(i) Timer settings

(ii) High-power operations

Notes (1) The power blackout auto restart function is set at on when the air-conditioner is shipped from the factory. Consult with your dealer if this function needs to be switched off.

(2) When power failure occurs, the timer setting is cancelled. Once power is resumed, reset the timer.

(3) If the jumper wire (J7) "AUTO RESTART" is cut, auto restart is disabled. (See the diagram at right)



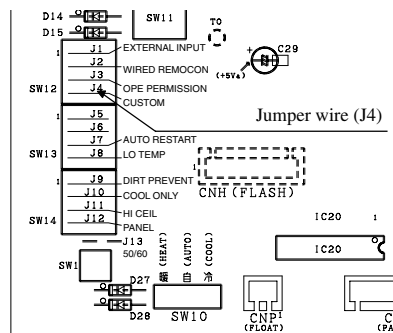
(4) Custom cord switching procedure

If two wireless remote controls are installed in one room, in order to prevent wrong operation due to mixed signals, please modify the printed circuit board in the indoor unit's control box and the remote control using the following procedure. Be sure to modify both boards. If only one board is modified, receiving (and operation) cannot be done.

(a) Modifying the indoor unit's printed circuit board

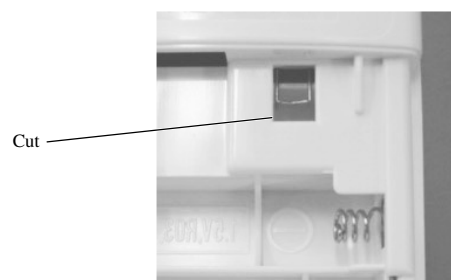
Take out the printed circuit board from the control box and cut off jumper wire (J4) using wire cutters.

After cutting of the jumper wire, take measures to prevent contact with the other the lead wires, etc.



(b) Modifying the wireless remote control

- 1) Remove the battery.
- 2) Cut the jumper wire shown in the figure at right.



(5) Flap and louver control

Control the flap and louver by AIRFLOW $\blacklozenge$ (UP/DOWN) and $\blacktriangleleft$ (LEFT/RIGHT) button on the wireless remote control.

(a) Swing flap

Flap moves in upward and downward directions continuously.

(b) Swing louver

Louver moves in left and right directions continuously.

(c) When not operating

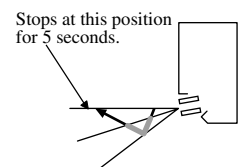
The flap returns to the position of air flow directly below, when operation has stopped.

(d) Multi-directional Air Flow (up/down air scroll and left/right air scroll)

Activating both up/down air swing and left/right air swing at the same time results in a multi-directional air flow.

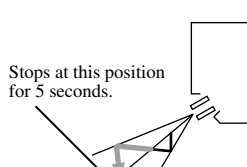
Up/down air scroll

In COOL, DRY and FAN operation



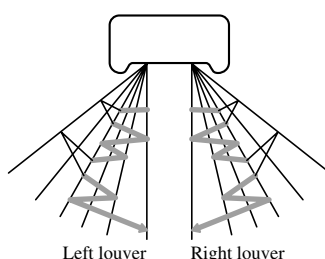
Thick line —: moves quickly
Thin line —: moves slowly

In HEAT operation

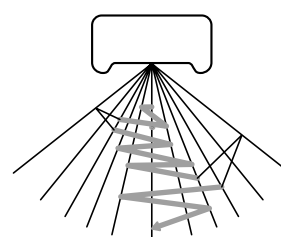


Left/right air scroll

In COOL, DRY and FAN operation



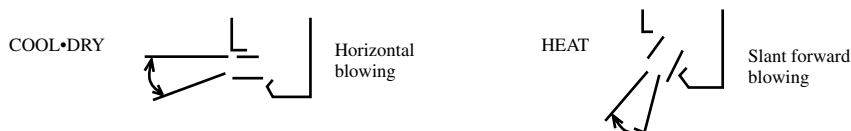
In HEAT operation



(e) Memory flap (Flap or Louver stopped)

When you press the AIRFLOW (UP/DOWN or LEFT/RIGHT) button once while the flap or louver is operating, it stops swinging at an angle. Since this angle is memorized in the microcomputer, the flap or louver will automatically be set at this angle when the next operation is started.

- Recommendable stopping angle of the flap



(6) Comfortable timer setting

If the timer is set at ON when the operation select switch is set at the cooling or heating, or the cooling or heating in auto mode operation is selected, the comfortable timer starts and determines the starting time of next operation based on the initial value of 15 minutes and the relationship between the room temperature at the setting time (temperature of room temperature sensor) and the setting temperature.
(Max. 60 minutes)

Operation mode	Operation start time correction value (Min.)		
At cooling	$3 < \text{Room temp.} - \text{Setting temp.}$	$1 < \text{Room temp.} - \text{Setting temp.} \leq 3$	$\text{Room temp.} - \text{Setting temp.} \leq 1$
	+5	No change	-5
At heating	$3 < \text{Setting temp.} - \text{Room temp.}$	$2 < \text{Setting temp.} - \text{Room temp.} \leq 3$	$\text{Setting temp.} - \text{Room temp.} \leq 2$
	+5	No change	-5

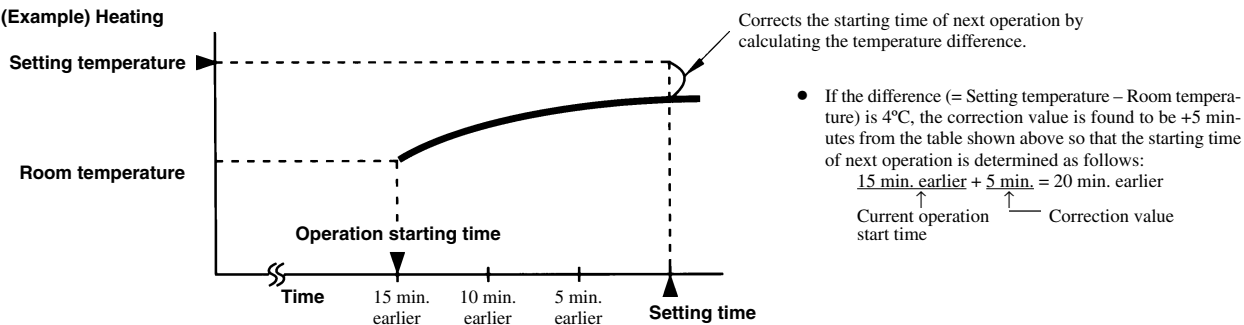
Notes (1) At 5 minutes before the timer ON time, operation starts regardless of the temperature of the room temperature sensor (Th1).

(2) This function does not actuate when the operation select switch is set at the dehumidifying as well as the dehumidifying in the auto mode.

However, the operation of item (1) above is performed during the dehumidifying in the auto mode.

(3) During the comfortable timer operation, both the run light and timer light illuminate and the timer light goes off after expiration of the timer, ON setting time.

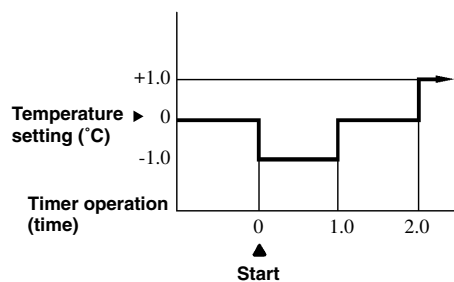
(Example) Heating



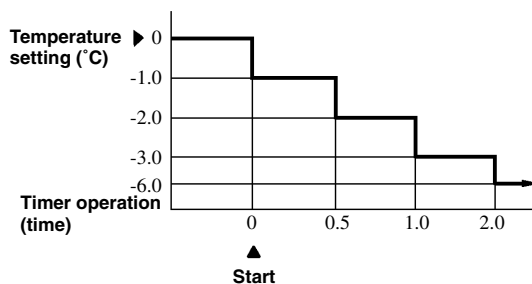
(7) Sleep timer operation

Pressing the SLEEP button causes the temperature to be controlled as shown in the following chart with respect to the set temperature.

Cooling, DRY



Heating



(8) Outline of heating operation (Heat pump type only)

(a) Operation of major functional components

Functional components \ Item	When the compressor command is OFF	When the compressor command is ON	When the compressor goes OFF due to an anomalous stop.
Indoor fan motor	ON	ON	OFF
Flap and louver	ON or OFF	ON or OFF	Stop position control
Display	Lights up	Lights up	Lights up or flashes
Outdoor fan motor	OFF	ON	Depending on the stop mode
4-way valve	Depending on the stop mode	ON	
Electric expansion valve		Depending on the EEV control	

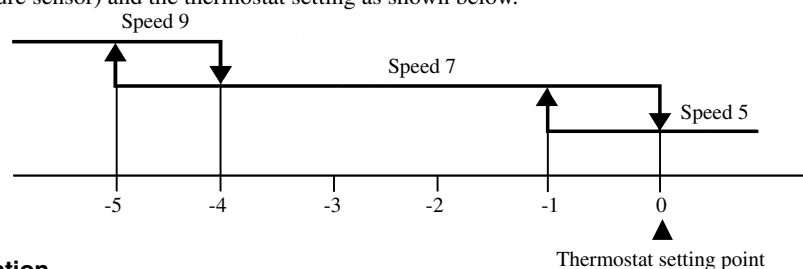
* However, the outdoor fan motor doesn't stop for one minute after the compressor stops.

(b) Fan speed switching

Fan speed switching \ Flow control	AUTO	HIGH	MED	LOW
Air scroll	Auto fan control	Speed 9	Speed 7	Speed 5
Swing flap or louver		Speed 9	Speed 7	Speed 5
Swing stop		Speed 9	Speed 7	Speed 5

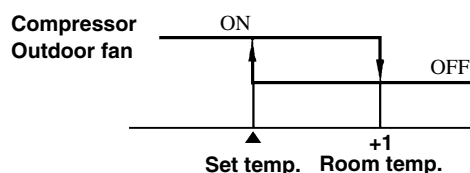
(i) Auto fan control

The indoor fan is automatically controlled in accordance with the difference between the room temperature (detected by the room temperature sensor) and the thermostat setting as shown below.



(c) Thermostat operation

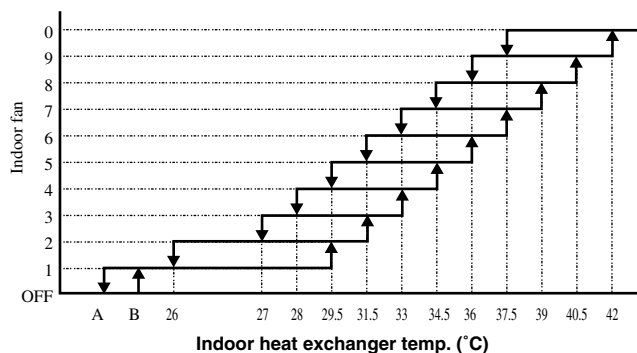
The compressor and outdoor fan are turned on and off as shown below according to the temperature setting.



(d) Hot keep

This function controls the indoor unit fan speed as shown below in accordance with the temperature sensed by the indoor heat exchanger sensor.

(i) Indoor unit fan control



• Values of A, B

	A	B
When the compressor command is OFF	22	25
When the compressor command is ON	17	19

Note (1) Refer to the table shown above right for the values A and B.

- (ii) To accomplish rapid recovery from the thermostat off state, after the compressor and outdoor unit's fan go OFF, the set temperature is raised by 1°C until 1 minute passes after the hot keep end temperature has been reached following restarting.

(h) Forced defrost

- (i) Forced defrost operation can be performed only once time within 20 second, after the power source is turned on, in accordance with the following operation.

1) Remote control operation

Operation	Run
Operation mode	Heating
Set temperature	19°C
Fan speed select	Low
Air flow setting	Up/down swing
On timer	ON
Current time	On after 180 min.condition
On timer time	

2) Functional components operation

Compressor	ON
4-way valve	OFF
Indoor unit fan	OFF
Flap and louver	Fully closed
Outdoor unit fan	OFF
Display	Same as defrost

- (ii) If remote control operation is performed, for 1 minute after 3-minute timer operation, the operation is canceled if one of the following conditions is satisfied.

- ① Outdoor heat exchanger temperature sensor: 14°C or higher
- ② 10 minutes has passed (including the 1 minute of forced operation).

(i) ECONOMY operation (“ECONO” button on the remote control : ON)

The set temperature changes as shown at right and the indoor unit fan runs at speed 5.

Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature -1.0
1~2 hours	Set temperature -2.0
2 hours ~	Set temperature -2.5

(9) Outline of cooling operation

(a) Operation of major functional components

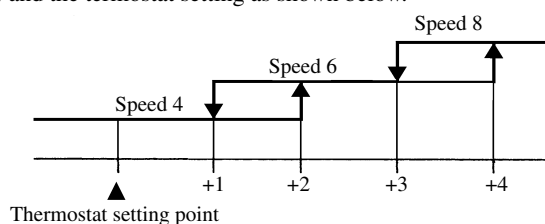
Functional components \ Item	When the compressor command is OFF	When the compressor command is ON	When the compressor goes OFF due to an anomalous stop.
Indoor fan motor	ON	ON	OFF
Flap and louver	ON or OFF	ON or OFF	Stop position control
Display	Lights up	Lights up	Lights up or flashes
Outdoor fan motor	Depending on the stop mode	ON	Depending on the stop mode
4-way valve		OFF	
Electric expansion valve		Depending on the EEV control	

(b) Fan speed switching

Fan speed switching \ Flow control	AUTO	HIGH	MED	LOW
Air scroll	Auto fan control	Speed 8	Speed 6	Speed 4
Swing flap or louver		Speed 8	Speed 6	Speed 4
Swing stop		Speed 8	Speed 6	Speed 4

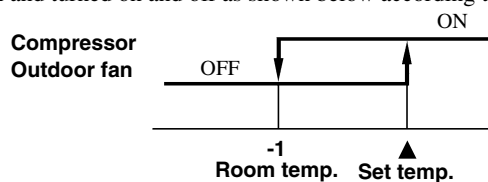
(i) Auto fan control

The indoor fan is automatically controlled in accordance with the difference between the room temperature (detected by the room temperature sensor) and the thermostat setting as shown below.



(c) Thermostat operation

The compressor and outdoor fan are turned on and off as shown below according to the temperature setting.



(d) HIGH POWER operation (“HI POWER” button on the remote control : ON)

The following operation is performed for 15 minutes without relation to the set temperature or fan speed setting.

Indoor unit fan	Speed 9 fixed
Outdoor unit fan	ON
Compressor	ON

Notes (1) Room temperature is not adjusted during the HIGH POWER operation.
(2) Protective functions will actuate with priority even during the HIGH POWER operation.

(e) ECONOMY operation (“ECONO” button on the remote control : ON)

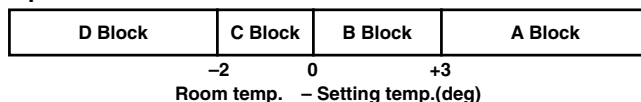
The set temperature changes as shown at right, and the indoor unit fan speed is set on speed 4.

Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature +0.5
1~2 hours	Set temperature +1.0
2 hours ~	Set temperature +1.5

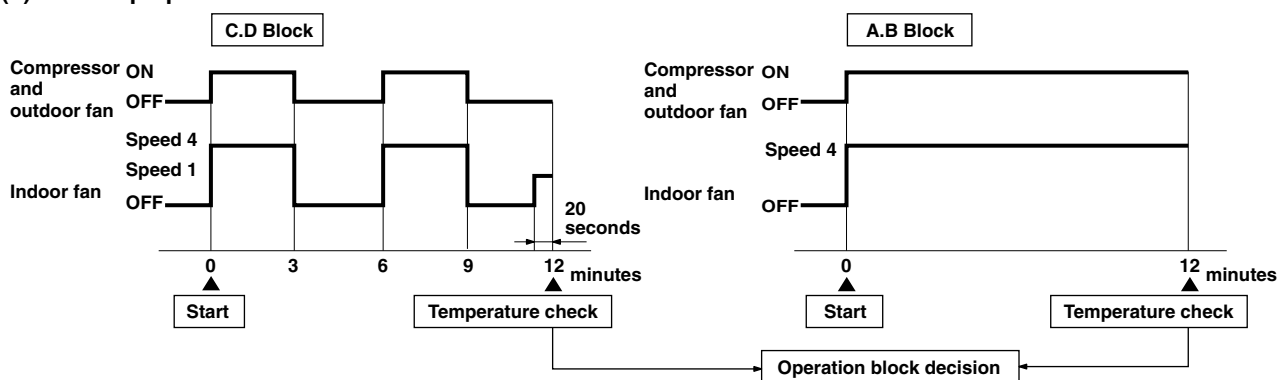
(10) Outline of dehumidifying operation

(a) Choose the appropriate operation block area by the difference between room temperature and thermostat setting temperature as shown below.

• Operation block area



(b) Start up operation

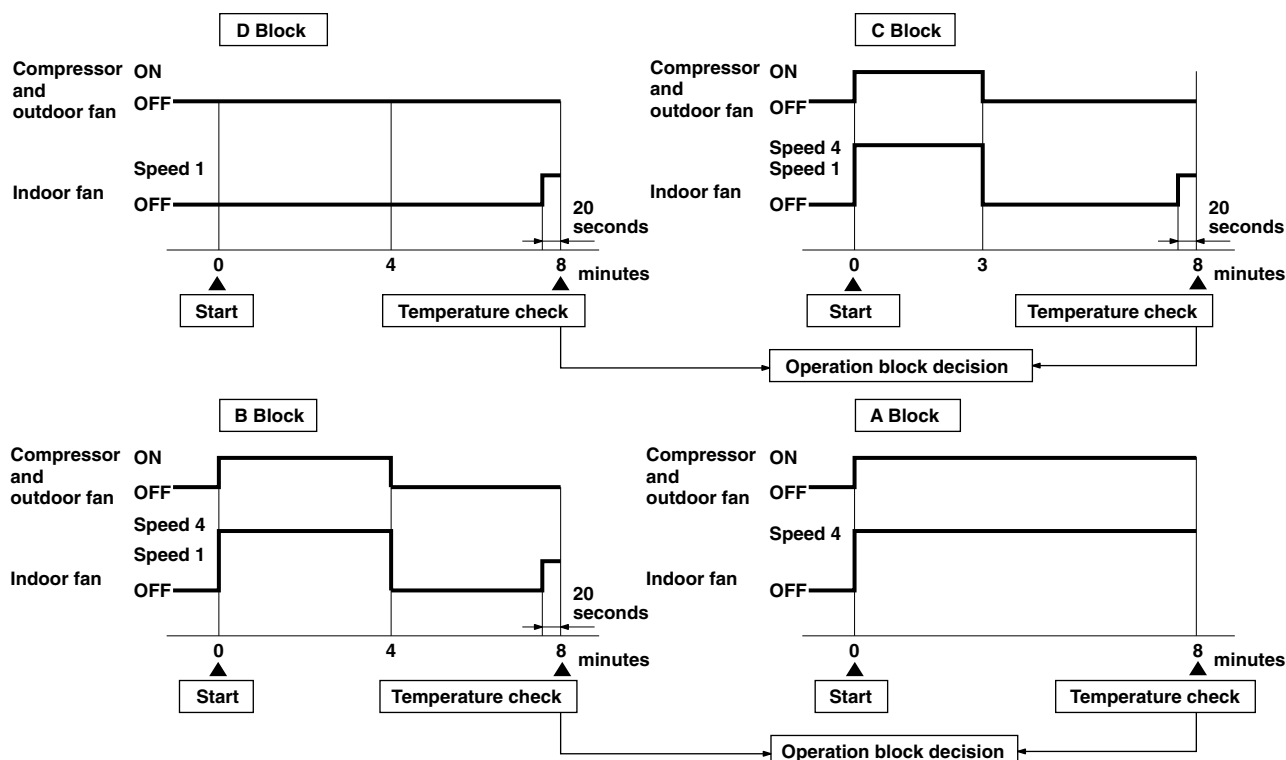


Note (1) Thermostat operation is performed in A, B Block. When compressor and indoor fan stop by thermostat operation within 12 minutes from start, temperature check is performed by operating indoor fan at speed 1 for 20 seconds before finishing 12 minutes and allowing decision of next operation block.

(c) DRY operation

After finishing start up operation described in (b) previous page, thermal dry operation is performed at 8 minutes intervals, according to the difference between room temperature and thermostat setting temperature as shown below.

Beside, 1 cycle of this operating time consists of 8 minutes, 7 cycle operation is performed then.



(d) ECONOMY operation ("ECONO" button on the remote control : ON)

The set temperature changes as shown at right, and the indoor unit fan speed is set on speed 4 .

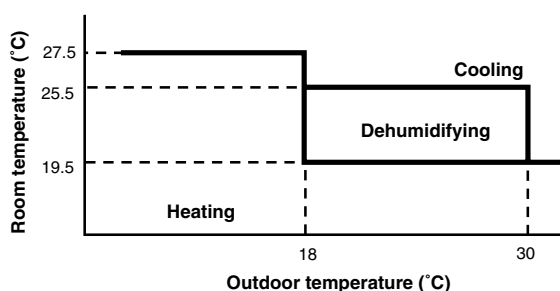
Running time	Set temperature compensation
Running start ~ 1 hour	Set temperature +0.5
1~2 hours	Set temperature +1.0
2 hours ~	Set temperature +1.5

(11) Outline of automatic operation

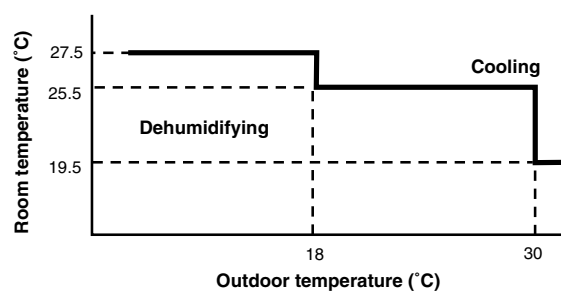
(a) Determination of operation mode

The unit checks the room temperature and the outdoor air temperature after operating the indoor and outdoor blowers for 20 seconds, determines the operation mode and the room temperature setting correction value, and then begins in the automatic operation.

• Heat pump type



• Cooling only type



- (b) Within 30 minutes after either auto or manual operation stops, if auto operation is started, or if you switch to auto operation during manual operation, the system runs in the previous operation mode.
- (c) The temperature is checked 1 time in 30 minutes after the start of operation, and if the judgment differs from the previous operation mode, the operation mode changes.
- (d) Setting temperature can be adjusted within the following range. There is the relationship as shown below between the signals of the wireless remote control and the setting temperature.

		Signals of wireless remote control (Display)												
		-6	-5	-4	-3	-2	-1	±0	+1	+2	+3	+4	+5	+6
Setting temperature	Cooling	18	19	20	21	22	23	24	25	26	27	28	29	30
	Dehumidifying	18	19	20	21	22	23	24	25	26	27	28	29	30
	Heating	20	21	22	23	24	25	26	27	28	29	30	31	32

(12) Outline of fan operation (Cooling only type only)

(a) Operation of major functional components

Fan speed switching	High power	AUTO	HIGH	MED	LOW	ECONO
Functional components						
52C	OFF					
Indoor fan motor	Speed 9	Speed 8	Speed 8	Speed 6	Speed 4	Speed 2
Outdoor fan motor	OFF					
Flap and louver	Depend on the flap and louver control					

(b) HIGH POWER operation (“HI POWER” button on the remote control : ON)

The following operation is performed for 15 minutes without relation to the set temperature or fan speed setting.

Indoor unit fan	Speed 9 fixed
Outdoor unit fan	OFF
Compressor	OFF

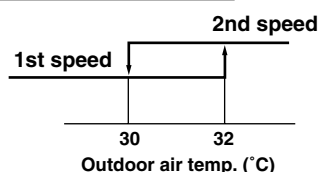
Note (1) Protective functions will actuate with priority even during the HIGH POWER operation.

(13) Regulation of outdoor air flow

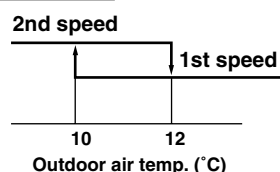
The fan operates as follows according to the outdoor air temperature. (Except during defrost.)

◆ SRK63 HE-S1, 63CE-S1

Cooling, thermaldry

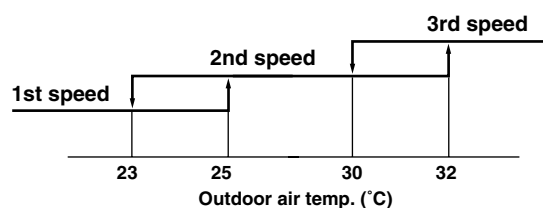


Heating

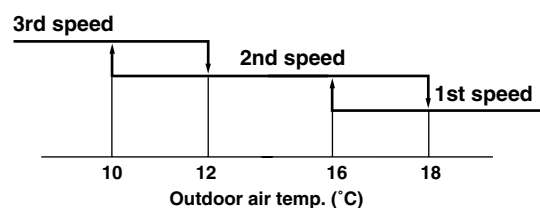


◆ SRK71 HE-S1, 71CE-S1

Cooling, thermaldry



Heating



(14) Stop mode

Functional components	Operation	When the complete stop command given, when there is and abnormal stoppage command		When stoppage occurs due to thermostat operation, switching operations and protective function operations	
		Cooling,cooling oriented dehumidifying	Heating,heating oriented dehumidifying	Cooling,cooling oriented dehumidifying	Heating,heating oriented dehumidifying
Compressor	ON				
	OFF				
Outdoor unit fan	ON				
	OFF				
4-way valve	ON				
	OFF				
Indoor unit fan	ON				
	OFF				
Flap	Fully closed				
	Set location				
EEV	150 pulse				
	EEV control				

(15) External control (remote display)/control of input signal

Make sure to connect the wired remote control unit. Control of input signal is not available without the wired remote control unit.

(a) External control (remote display) output

Following output connectors (CNT) are provided on the printed circuit board of indoor unit.

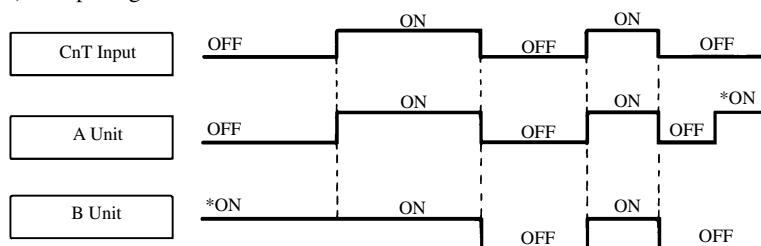
- (i) Operation output: Power to engage DC 12V relay (provided by the customer) is outputted during operation.
- (ii) Heating output: Power to engage DC 12V relay (provided by the customer) is outputted during the heating operation.
- (iii) Compressor ON output: Power to engage DC 12V relay (provided by the customer) is outputted while the compressor is operating.
- (iv) Error output: When any error occurs, the power to engage DC 12V relay (provided by the customer) is outputted.

(b) Control of input signal

Control of input signal (switch input, timer input) connectors (CNT) are provided on the control circuit board of the indoor unit. However, when the operation of air conditioner is under the Center Mode, the remote control by CnT is invalid.

- (i) If the factory settings (Jumper wire J1 EXTERNAL INPUT on the PCB) are set, or "LEVEL INPUT" is selected in the wired remote control's indoor unit settings.

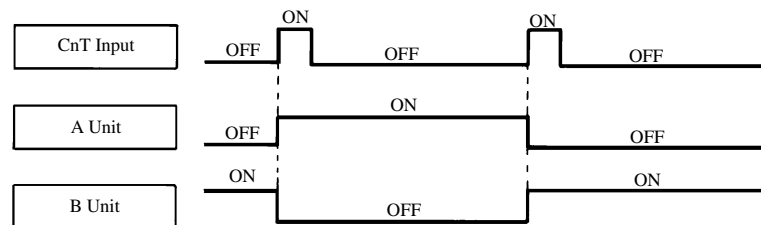
- 1) Input signal to CnT OFF → ON - - - - Air conditioner ON
- 2) Input signal to CnT ON → OFF - - - - Air conditioner OFF



Note (1) The ON with the * mark indicates an ON operation using the remote control unit switch, etc.

- (ii) When Jumper wire J1 on the PCB of indoor unit is cut at the field or "PULSE INPUT" is selected in the wired remote control's indoor unit settings.

Input signal to CnT becomes valid at OFF → ON only and the motion of air conditioner [ON/OFF] is inverted.



(16) Operation permission/prohibition control

The air conditioner operation is controlled by releasing the jumper wire (J3) on the indoor control board and inputting the external signal into the CnT.

- (a) **The operation mode is switched over between Permission and Prohibition by releasing the jumper wire (J3) on the indoor control board.**

When the jumper wire (J3) is short circuited	When the jumper wire (J3) is released
Normal operation is enable (when shipping) When CnT input is set to ON, the operation starts and if the input is set to OFF, the operation stops. For the CnT and remote control inputs, the input which is activated later has priority and can start and stop the operation.	Permission / Prohibition mode When Cnt input is set to ON, the operation mode is changed to permission and if input is set to OFF the operation is prohibited.

- (b) **When the CnT input is set to ON (Operation permission)**

- (i) The air conditioner can be operated or stopped by the signal from the remote control signal line.
(When the "CENTER" mode is set, the operation can be controlled only by the center input.)
- (ii) When the CnT input is changed from OFF to ON, the air conditioner operation mode is changed depending on the status of the jumper wire (J1) on the indoor control board.

When the jumper wire (J1) is short circuited	When the jumper wire (J1) is released
The signal (i) above starts the air conditioner. (Shipping status)	When the CnT input is set to ON, the air conditioner starts operation. After that, the operation of the air conditioner depends on (i) above. (Local status)

- (c) **When the CnT input is set to OFF (Prohibition)**

- (i) The air conditioner cannot be operated or stopped by the signal from the remote control signal line.
- (ii) The air conditioner operation is stopped when the CnT input is changed from ON to OFF.

- (d) **When the operation permission / prohibition mode is set to effective by the indoor function setting selected by the remote control, the operation depends on (a) above.**

(17) Protective control function

- (a) **Frost prevention for indoor heat exchanger** (During cooling or dehumidifying)

- (i) **Operating conditions**

- Indoor heat exchanger temperature sensor (detected with Th2) is lower than 2.5°C.
- 5 minutes elapsed after the start of operation.

- (ii) **Detail of frost prevention operation**

Compressor	OFF
Indoor fan	Protects the fan tap just before frost prevention control.
Outdoor fan	Depending on the stop mode
4-way valve	Stop mode

- (iii) **Reset condition:** Indoor heat exchanger temperature sensor (Th2) is higher than 8°C.

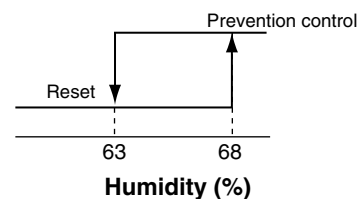
(b) Dew condensation prevention control [Cooling (including automatic), cooling oriented dehumidifying operation]

(i) Operating condition: When the following conditions are met after 5 minutes or more of continuous operation after operation starts.

- The humidity sensor value is 68% or higher

(ii) Operation contents

- 1) Command of the electronic expansion valve.
- 2) When such a command is continued for 30 minutes or more, air direction controls will be as listed below:



UP/ DOWN air scroll	Flap swing, UP/DOWN air scroll	Executes the command to the left.
	Situations besides the ones described above	Controls the level of the UP/DOWN flap.
LEFT/ RIGHT air scroll	Louver swing, LEFT/RIGHT air scroll,	Executes the command to the left.
	Multi-directional Air Flow	
	Situations besides the ones described above	Controls the front of the LEFT/RIGHT louver .

(iii) Reset condition: When the following condition is satisfied.

- The humidity sensor value is less than 63%.

(c) Indoor fan motor protection

When the air-conditioner is operating and the indoor fan motor is turned ON, if the indoor fan motor has operated at 300 rpm or under for more than 30 seconds, the unit enters first in the stop mode and then stops the entire system.

Timer light illuminates simultaneously and the run light flashing 6 times at each 8-second.

(d) Three-minute forced operation

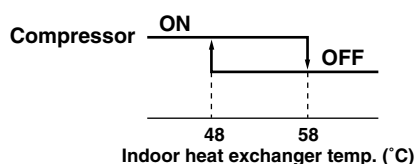
When the compressor begins operating the thermal operation is not effective for 3 minutes, so operation continues as is in the operation mode. (After 3 minutes has passed the thermal operation is effective.)

However, stopping the compressor via a stop signal or protection control has priority.

(e) High-pressure control (During heating)

The indoor heat exchanger temperature sensor detection temperature controls the compressor.

- When the indoor heat exchanger temperature is $\geq 58^{\circ}\text{C}$



(f) Abnormality of outdoor unit

(i) Cooling operation

When the indoor heat exchanger temperature does not fall to 25°C or below for 40 minutes after 5 minutes have elapsed since the compressor operation start, the abnormality stop occurs. (The timer light flashes 2 times.)

(ii) Heating operation

- ① The indoor heat exchanger temperature $< 5^{\circ}\text{C}$ for 5 minutes and more

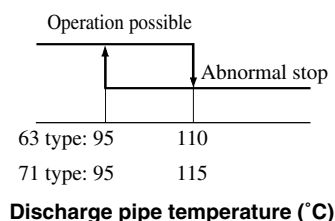
The unit is stopped due to the outdoor unit abnormality excepting the defrost operation time. (The timer light flashes 2 times.)

- ② $5^{\circ}\text{C} \leq$ the indoor heat exchanger temperature $< 30^{\circ}\text{C}$ for 40 minutes and more

When the indoor heat exchanger temperature does not rise to 30°C or over for more than 40 minutes after 5 minutes have elapsed since the compressor operation start, the abnormality stop occurs. However, when the indoor fan began operation once, this function is not activated until the unit is stopped or the mode is changed. (The timer light flashes 2 times when 20 minutes have elapsed.)

(g) Compressor overheat protection

If the discharge pipe temperature (sensed by Th6) exceeds the set temperature value, the compressor stops. If the temperature is 95°C or lower after a 3-minute delay, it starts again, but if this function is reactivated again within 60 minutes, it results in an abnormal stop. (Run light : ON, Timer light : 5 time flash)



(h) Serial signal transmission error protection

(i) Purpose: Prevents malfunction resulting from error on the indoor ↔ outdoor signals.

(ii) Detail of operation: If the compressor is operating and a serial signal cannot be received from the indoor control with outdoor control having serial signals continuously for 1 minute and 55 seconds, the compressor is stopped.

After the compressor has been stopped, it will be restarted after the compressor start delay if a serial signal can be received again from the indoor control.

(RUN light: ON, TIMER light: 6 time flash)

(i) Sensor disconnection (room temperature, indoor heat exchanger, outdoor heat exchanger, outdoor temperature, discharge pipe)

(i) Room temperature sensor

If the temperature detected by the room temperature sensor is -20°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed. (Run light: 2 time flash, Time light: ON)

(ii) Indoor heat exchanger temperature sensor

If the temperature detected by the indoor heat exchanger temperature sensor is -20°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed.

Also, if the temperature detected by the indoor heat exchanger temperature sensor is -20°C or lower continuously for 3 minutes after heating operation has started, the indoor unit's fan speed is forcibly raised to speed 5. After this, the air-conditioner is stopped if the detected temperature remains at -20°C continuously for 40 minutes. (Run light : 1 time flash, Timer light : ON)

(iii) Outdoor heat exchanger temperature sensor

If the temperature detected by the outdoor heat exchanger temperature sensor is -64°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed.

Also, the air-conditioner is stopped if the temperature detected by the outdoor heat exchanger temperature sensor remains at -50°C or lower continuously for 40 minutes after heating operation has started. (Run light : keep flashing, Timer light : 2 time flash)

(iv) Outdoor air temperature sensor

If the temperature detected by the outdoor air temperature sensor is -64°C or lower continuously for 15 seconds or longer while operation is stopped, an error indication is displayed. (Run light : keep flashing, Timer light : 1 time flash)

(v) Discharge pipe temperature sensor

After the compressor has operated for 9 minutes continuously, if there is a disconnected signal for the discharge pipe temperature sensor detected -64°C for 15 seconds, the compressor stops. After a 3-minute delay, it restarts, but if an abnormality is detected 4 times continuously, the air-conditioner is stopped fully and an error indication is displayed. (Run light : keep flashing, Timer light : 4 time flash)

2.3.5 APPLICATION DATA

SAFETY PRECAUTIONS

- Please read these “Safety Precautions” first then accurately execute the installation work.
- Though the precautionary points indicated herein are divided under two headings, **⚠ WARNING** and **⚠ CAUTION**, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the **⚠ WARNING** section. However, there is also a possibility of serious consequences in relationship to the points listed in the **⚠ CAUTION** section as well. In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.
- After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner’s manual. Moreover, ask the customer to keep this sheet together with the owner’s manual.



WARNING

- To disconnect the appliance from the mains supply this appliance must be connected to the mains by means of a circuit breaker or a switch (use a recognized 20A) with a contact separation of at least 3mm.
- The appliance shall be installed in accordance with national wiring regulations.
- This system should be applied to places as households, residences and the like. Application to inferior environment such as engineering shop could cause equipment malfunction.
- Please entrust installation to either the company which sold you the equipment or to a professional contractor. Defects from improper installations can be the cause of water leakage, electric shocks and fires.
- Execute the installation accurately, based on following the installation manual. Again, improper installations can result in water leakage, electric shocks and fires.
- For installation, confirm that the installation site can sufficiently support heavy weight. When strength is insufficient, injury can result from a falling of the unit.
- For electrical work, please see that a licensed electrician executes the work while following the safety standards related to electrical equipment, and local regulations as well as the installation instructions, and that only exclusive use circuits are used.
Insufficient power source circuit capacity and defective installment execution can be the cause of electric shocks and fires.
- Accurately connect wiring using the proper cable, and insure that the external force of the cable is not conducted to the terminal connection part, through properly securing it. Improper connection or securing can result in heat generation or fire.
- Take care that wiring does not rise upward, and accurately install the lid/service panel. It's improper installation can also result heat generation or fire.
- When setting up or moving the location of the air conditioner, do not mix air etc. or anything other than the designated refrigerant (R410A) within the refrigeration cycle.
Rupture and injury caused by abnormal high pressure can result from such mixing.
- Always use accessory parts and authorized parts for installation construction. Using parts not authorized by this company can result in water leakage, electric shock, fire and refrigerant leakage.
- Ventilate the work area when refrigerant leaks during the operation. 
Coming in contact with fire, refrigerant could generate toxic gas.
- Confirm after the foundation construction work that refrigerant does not leak.
If coming in contact with fire of a fan heater, a stove or movable cooking stove, etc., refrigerant leaking in the room could generate toxic gas.
- In joining pipes, do not use conventional (R22) piping flare nuts, etc. The use of conventional piping materials may lead to the rupture of piping due to higher pressure used for the refrigerant cycle and possible personal injury.
(Use only piping material designed specifically for R410A)



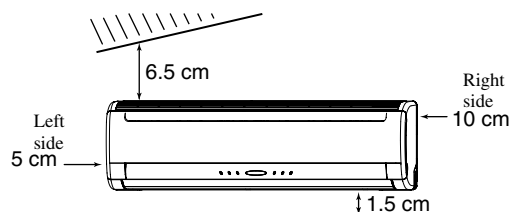
CAUTION

- Execute proper grounding. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or a telephone ground wire. 
Improper placement of ground wires can result in electric shock.
- The installation of an earth leakage breaker is necessary depending on the established location of the unit. Not installing an earth leakage breaker may result in electric shock.
- Do not install the unit where there is a concern about leakage of combustible gas. 
The rare event of leaked gas collecting around the unit could result in an outbreak of fire.
- For the drain pipe, follow the installation manual to insure that it allows proper drainage and thermally insulate it to prevent condensation. Inadequate plumbing can result in water leakage and water damage to interior items.
- Do not place objects near the outdoor unit or allow leaves to gather around the unit. If there are objects or leaves around the outdoor unit, small animals may enter unit and contact electrical parts resulting in break down, emission of smoke or flame.

(1) Selection of location for installation

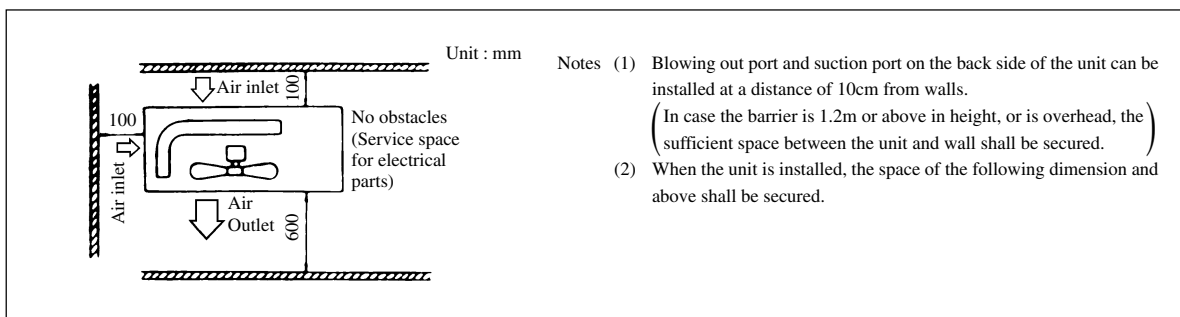
(a) Indoor unit

- Where there is no obstructions to the air flow and where the cooled air can be evenly distributed.
- A solid place where the unit or the wall will not vibrate.
- A place where there will be enough space for servicing. (Where space mentioned right can be secured)
- Where wiring and the piping work will be easy to conduct.
- The place where receiving part is not exposed to the direct rays of the sun or the strong rays of the street lighting.
- A place where it can be easily drained.
- A place separated at least 1m away from the television or the radio.
(To prevent interference to images and sound.)



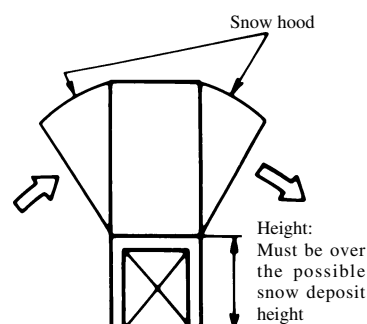
(b) Outdoor unit

- A place where good air circulation can be obtained and where rain, snow or sunshine will not directly strike the unit.
 - A place where intake air temperature is over 46°C, it is desirable to install a roof avoiding the sunlight.
- A place where discharged hot air or unit's operating sound will not be a nuisance to the neighborhood.
- A place where servicing space can be secured.
- A place where vibration will not be enlarged.
- Avoid installing in the following places.
 - A place near the bedroom and the like, so that the operation noise will cause no trouble.
 - A place where there is possibility of flammable gas leakage.
 - A place exposed to strong wind.
- Do not install the unit near the seaside, or where there is possibility of chlorine gas generation.



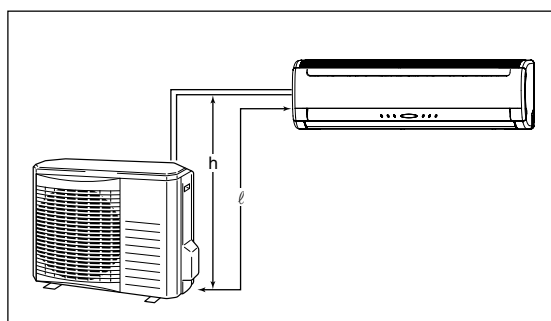
- In heating operation, snow deposit on the heat-exchanger of outdoor unit must be prevented for keeping the normal performance capacity. (Heat pump type only)

- Snow-hood on outdoor unit as in drawing, will reduce the frequency of defrost operation.
When installing the snow hood, take care so that the air outlet of the snow hood will not face directly into the most windy direction.
- Design the base higher than possible snow deposit.



(c) Limitations for one way piping length and vertical height difference.

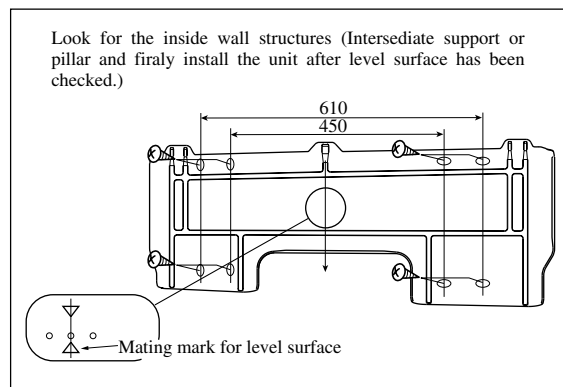
Model		All models
Item		
One way piping length (ℓ)		25 m
Vertical height difference (h)	Outdoor unit is lower	15 m
	Outdoor unit is higher	15 m



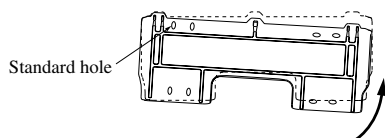
(2) Installation of indoor unit

(a) Installation of installation board

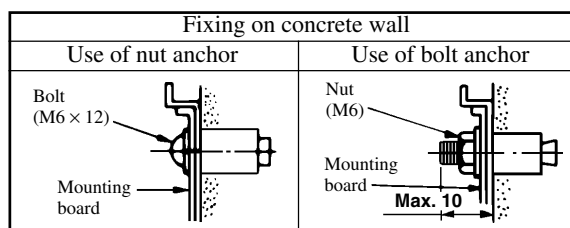
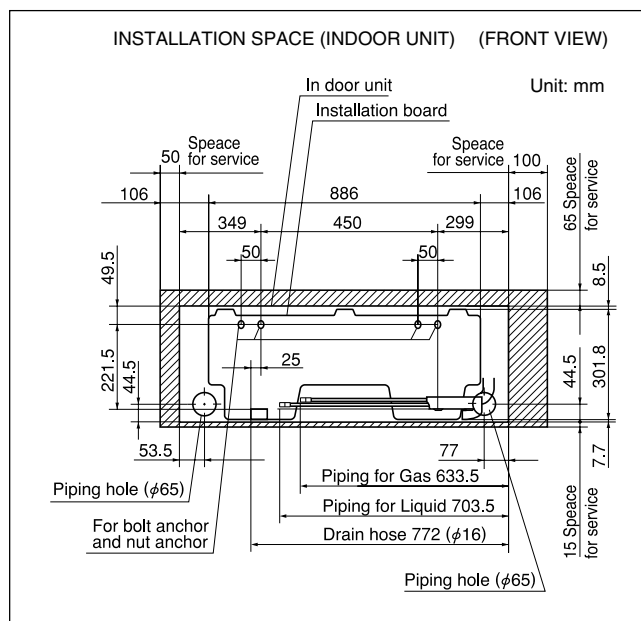
(i) Fixing of installation board



Adjustment of the installation board in the horizontal direction is to be conducted with four screws in a temporary tightened state.



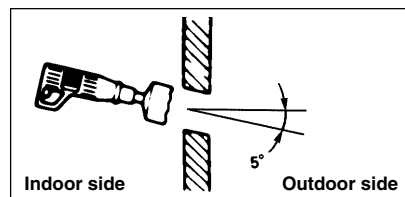
Adjust so that board will be level by turning the board with the standard hole as the center.



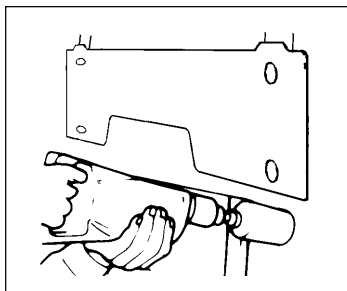
(b) Drilling of holes and fixture sleeve (Option parts)

When drilling the wall that contains a metal lath, wire lath or metal plate, be sure to use pipe hole sleeve sold separately.

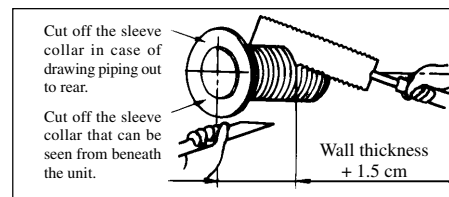
(i) Drill a hole with ø65 whole core drill



Note (1) Drill a hole with incline of 5 degree from indoor side to outdoor side.

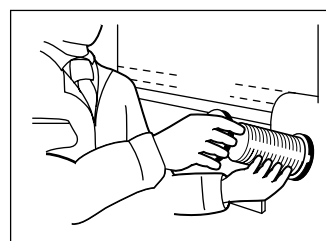


(ii) Adjusting sleeve length

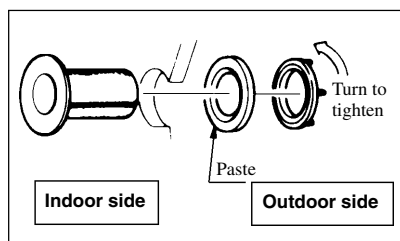


(iii) Install the sleeve

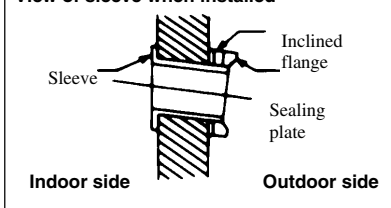
(Inserting sleeve)



(*Sleeve + *Inclined + *Sealing plate)



View of sleeve when installed



(c) Preparation of indoor unit

(i) Mounting of connecting wires

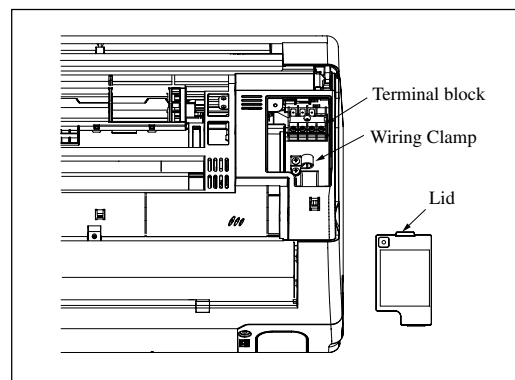
- 1) Open the air inlet panel.
- 2) Remove the lid.
- 3) Remove the wiring clamp.
- 4) Connect the connecting wire securely to the terminal block.

Use cables for interconnection wiring to avoid loosening of the wires.

CENELEC code for cables. Required field cables.

H05RNR4G1.5 (Example)

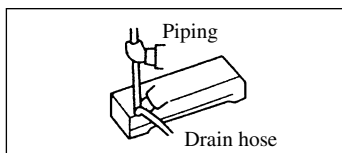
- H Harmonized cable type
- 05 300/500 volts
- R Natural-and/or synth, rubber wire insulation
- N Polychloroprene rubber conductors insulation
- R Standed core
- 4 Number of conductors
- G One conductor of the cable is the earth conductor (yellow/green)
- 1.5 Section of copper wire (mm²)



- ① Connect the connection wire securely to the terminal block. If the wire is not affixed completely, contact will be poor, and it is dangerous as the terminal block may heat up and catch fire.
- ② Take care not to confuse the terminal numbers for indoor and outdoor connections.
- ③ Affix the connection wire using the wiring clamp.
- 5) Fix the connecting wire by wiring clamp.
- 6) Attach the lid.
- 7) Close the air inlet panel.

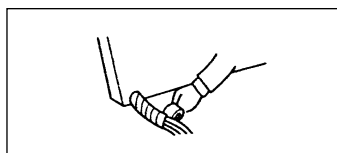
(ii) Installing the support of piping

[Shaping the piping]



- Hold the bottom of the piping and fix direction before stretching it and shaping it.

[Taping of the exterior]



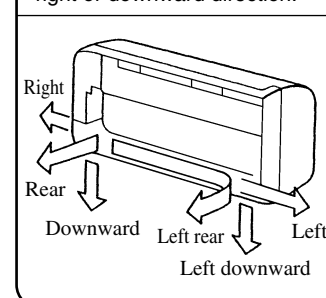
- Tape only the portion that goes through the wall.
Always tape the crossover wiring with the piping.

[When the hose is extended to left and taken out from the rear center]

[Top View]

Left-hand-sided-piping	Right-hand-sided-piping

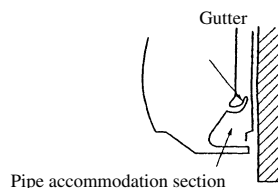
Piping is possible in the rear, left, left rear, left downward, right or downward direction.



[Drain hose changing procedures]

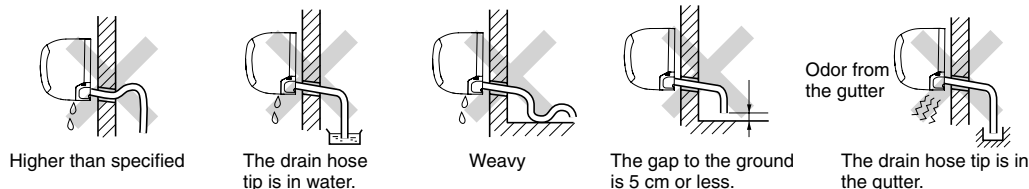
1. Remove the drain hose.	2. Remove the drain cap.	3. Insert the drain cap.	4. Connect the drain hose.
● Remove the drain hose, making it rotate.	● Remove it with hand or pliers.	● Insert the drain cap which was removed at procedure "2" securely using a hexagonal wrench, etc. Note: Be careful that if it is not inserted securely, water leakage may occur.	● Insert the drain hose securely, making it rotate. Note: Be careful that if it is not inserted securely, water leakage may occur.

Since this air conditioner has been designed to collect dew drops on the rear surface to the drain pan, do not attach the power cord above the gutter.

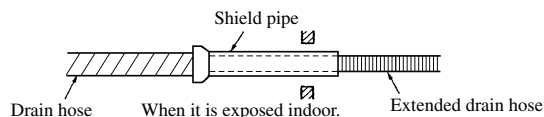


Drainage

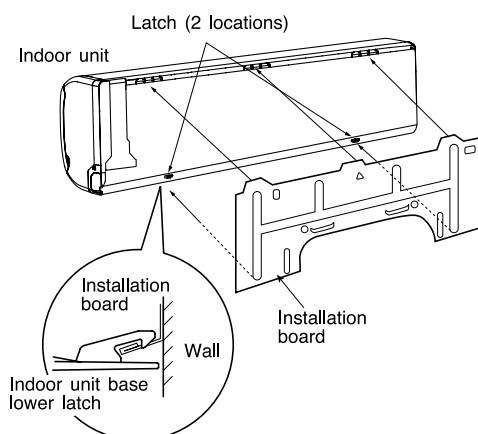
- Arrange the drain hose in a downward angle.
- Avoid the following drain piping.



- Pour water to the drain pan located under the heat exchanger, and ensure that the water is discharged outdoor.
- When the extended drain hose is indoor, always use a shield pipe (to be arranged by the user) and ensure it is thermally insulated.

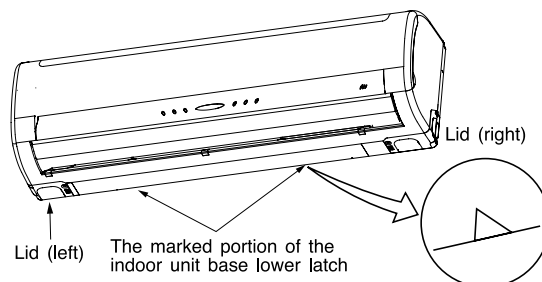


(iii) Fixing of indoor unit



Installation Steps	
① Pass the pipe through the hole in the wall, and hook the upper part of the indoor unit to the installation board.	
② Gently push the lower part to secure the unit.	

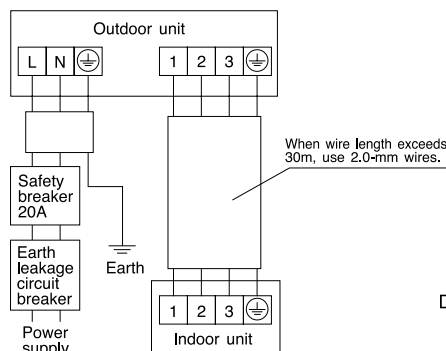
- How to remove the indoor unit from the installation board
 - ① Push up at the marked portion of the indoor unit base lower latch, and slightly pull it toward you.
(both right and left hand sides)
(The indoor unit base lower latch can be removed from the installation board)
 - ② Push up the indoor unit upward. So the indoor unit will be removed from the installation board.



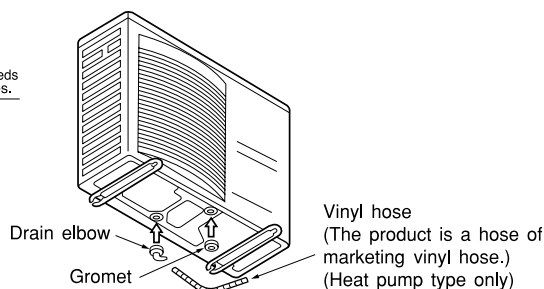
(3) Installation of outdoor unit

(a) Installation of outdoor unit

- Make sure that the unit is stable in installation. Fix the unit to stable base.
- When installing the unit at a higher place or where it could be toppled by strong winds, secure the unit firmly with foundation bolts, wire, etc.
- Perform wiring, making wire terminal numbers conform to terminal numbers of indoor unit terminal block.
- Connect using ground screw located near $\oplus$ mark.
- In areas where the temperatures drop below 0°C for several continuous days, do not install a drain elbow. (Water discharge could stop due to freezing.) (Heat pump type only)



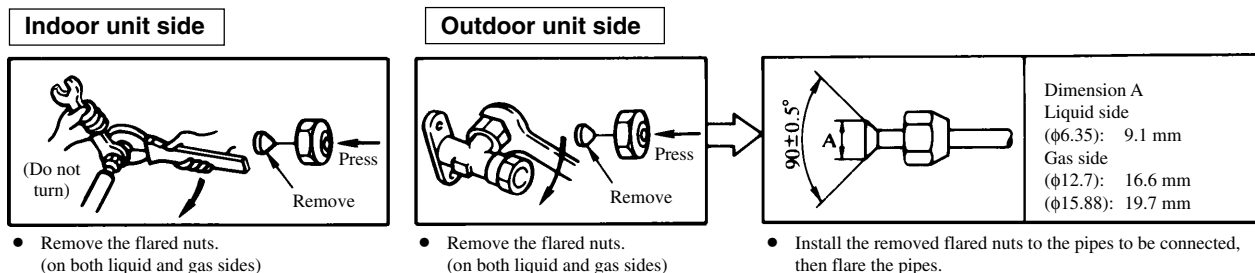
Power supply code
CENELEC code for cables requiring field cables
H05RNR3G2.5



(4) Refrigerant piping

(a) Preparation

Keep the openings of the pipes covered with tapes etc. to prevent dust, sand, etc. from entering them.

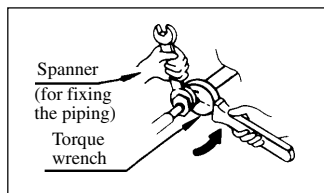


Dimension A
Liquid side
($\phi 6.35$): 9.1 mm
Gas side
($\phi 12.7$): 16.6 mm
($\phi 15.88$): 19.7 mm

(b) Connection of refrigerant piping

Indoor unit side

- Connect firmly gas and liquid side pipings by Torque wrench.



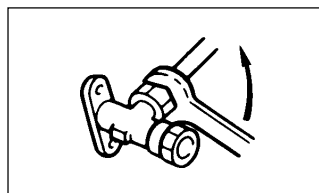
- Specified torquing value:

Liquid side ($\phi 6.35$) : 14.0~18.0N·m (1.4~1.8kgf·m)
Gas side ($\phi 12.7$) : 49.0~61.0N·m (4.9~6.1kgf·m)
($\phi 15.88$) : 68.0~82.0N·m (6.8~8.2kgf·m)

- Always use a Torque wrench and back up spanner to tighten the flare nut.

Outdoor unit side

- Connect firmly gas and liquid side pipings by Torque wrench.



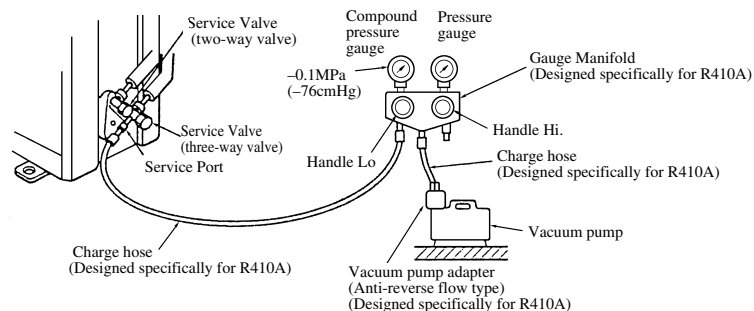
- Specified torquing value:

Liquid side ($\phi 6.35$) : 14.0~18.0N·m (1.4~1.8kgf·m)
Gas side ($\phi 12.7$) : 49.0~61.0N·m (4.9~6.1kgf·m)
($\phi 15.88$) : 68.0~82.0N·m (6.8~8.2kgf·m)

- Use one more spanner to fix the valve.

(c) Air purge

- (i) Tighten all flare nuts in the pipings both indoor and outside will so as not to cause leak.
- (ii) Connect service valve, charge hose, manifold valve and vacuum pump as is illustrated below.
- (iii) Open manifold valve handle Lo to its full width, and perform vacuum or evacuation.
Continue the vacuum or evacuation operation for 15 minutes or more and check to see that the vacuum gauge reads -0.1 MPa (-76 cmHg).
- (iv) After completing vacuum operation, fully open service valve (Both gas and liquid sides) with hexagon headed wrench.
- (v) Detach the charge hoses.
- (vi) Check for possible leakage of gas in the connection parts of both indoor and outdoor.



- Since the system uses service ports differing in diameter from those found on the conventional models, a charge hose (for R22) presently in use is not applicable.
Please use one designed specifically for R410A
- Please use an anti-reverse flow type vacuum pump adapter so as to prevent vacuum pump oil from running back into the system.
Oil running back into an air-conditioning system may cause the refrigerant cycle to break down.

Additional refrigerant charge

When refrigerant piping exceeds 15m conduct additional refrigerant charge by weight after refrigerant piping completion.
Additional charge amount per meter = 25g/m (71 type), 20g/m (63 type)

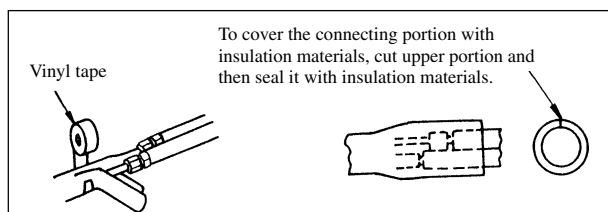
[Example] (71 type)

How much amount of additional charge for 25m piping?

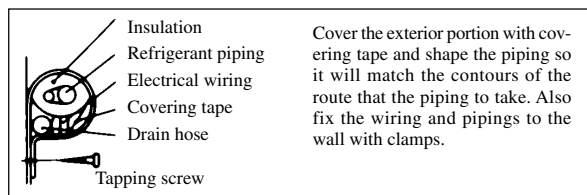
$$(25 - 15)m \times 25g/m = 250g \quad \boxed{250g \text{ for additional charge}}$$

(d) Insulation of connecting portion

- (i) Cover the connecting portion of the refrigerant piping with the pipe cover and seal them.
If neglecting to do so, moisture occurs on the piping and water will drip out.



- (ii) Finishing and fixing
 - 1) Tie up the piping with wrapping tape, and shape it so that it conforms to which the pipe is attached.
 - 2) Fix them with clamps as right figure.



(5) Test run

- (a) Conduct trial run after confirming that there is no gas leaks.
- (b) When conducting trial run set the remote controller thermostat to continuous operation position. However when the power source is cut off or when the unit's operation switch is turned off or was turned to fan operation position, the unit will not go into operation in order to protect the compressor.
- (c) Insert in electric plug into the electric outlet and make sure that it is not loose.
 - (i) When there is something wrong with the electric outlet and if the insertion of the electric plug is insufficient, there may occur a burn out.
 - (ii) It is very important to be careful of above when plugging in the unit to an already furnished electrical outlet.

(d) Explain to the customer on the correct usage of the air conditioner in simple layman's terms.

(e) Make sure that drain flows properly.

(f) **Standard operation data**

(220/230/240V)

Model		SRK63HE-S1	SRK71HE-S1
Item			
High pressure (MPa)	Cooling	–	–
	Heating	2.37	2.62
Low pressure (MPa)	Cooling	0.89	0.88
	Heating	–	–
Temp. difference between return air and supply air (°C)	Cooling	12.9	13.4
	Heating	16.2	17.4
Running current (A)	Cooling	10.9/10.5/10.0	11.0/10.6/10.1
	Heating	9.2/8.8/8.5	10.3/9.9/9.5

Model		SRK63CE-S1	SRK71CE-S1
Item			
Low pressure (MPa)	Cooling	0.89	0.88
Temp. difference between return air and supply air (°C)	Cooling	12.9	13.4
Running current (A)	Cooling	10.9/10.5/10.0	11.0/10.6/10.1

Note (1) The data are measured at following conditions

Ambient air temperature

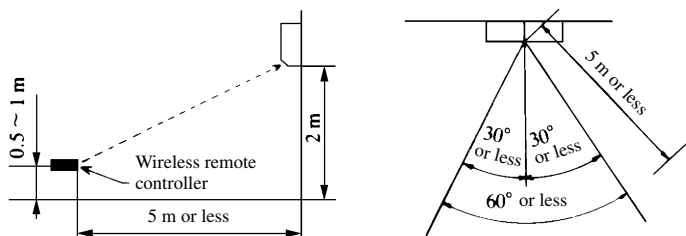
Indoor side: Cooling ... 27°C DB, 19°C WB, Heating ... 20°C DB

Outdoor side: Cooling ... 35°C DB, 24°C WB, Heating ... 7°C DB, 6°C WB

(6) Precautions for wireless remote control installation and operation

(a) **Wireless remote control covers the following distances:**

(i) **When operating facing the air conditioner:**



If the distances exceed the area indicated above, be sure to check the receiver status.

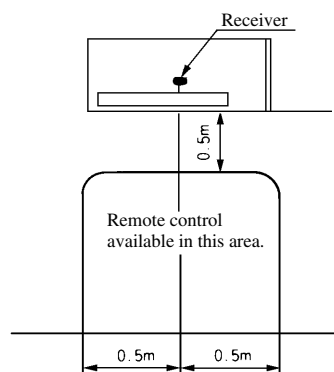
(ii) **When manipulating the remote control mounted on a wall:**

Make sure that it works normally (i.e., transmission/reception signal is audible) before mounting.

Notes (1) The remote control is correctly facing the sensing element of the air conditioner when being manipulated.

(2) The typical coverage is indicated (in the left illustration). It may be more or less depending on the installation.

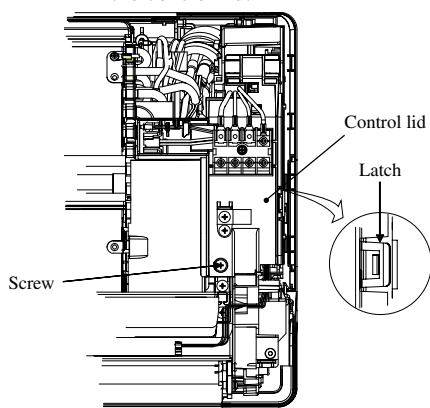
(3) The coverage may be less or even nil. If the sensing element is exposed to strong light, such as direct sunlight, illumination, etc., or dust is deposited on it or it is used behind a curtain, etc.



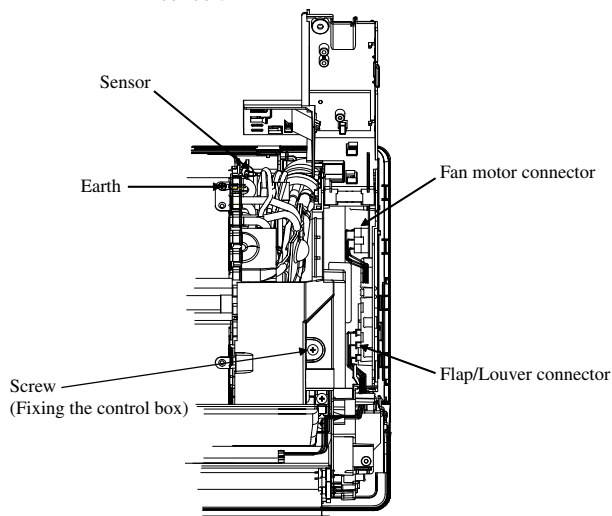
(7) Installation of wired remote control and super link adapter (SC-AD-E) (Optional parts)

(a) Modifying the indoor unit's printed circuit board

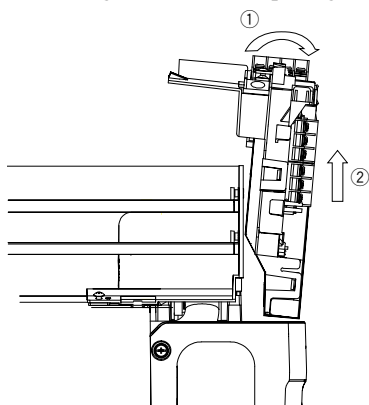
- (i) Remove the air inlet panel (Refer to the installation directions).
- (ii) Remove the front panel (Refer to the installation directions).
- (iii) Remove the control box
 - Remove the screw and the latch, and open the control lid.



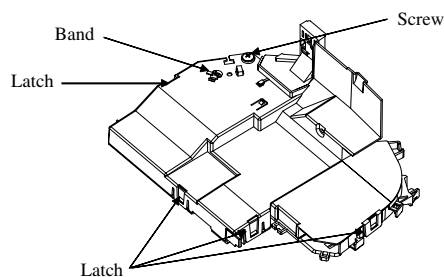
- Remove the flap connector, the louver connector, the fan motor connector, the earth and the sensor.



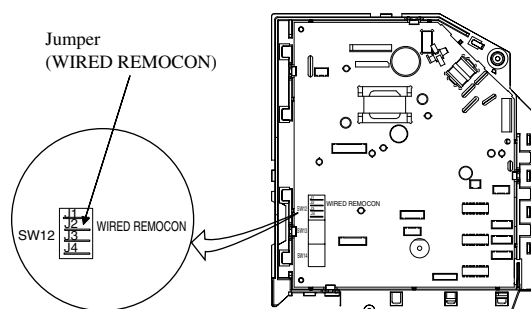
- Remove the screw fixing the control box.
- Remove the control box from the base.
- It is possible to remove the control box from the base by leaning the control box slightly to right-hand side and pulling it toward you.



- (iv) Cut the jumper attached on the board.
 - Remove the upper box.
 - Remove the screw, the latch and the band.

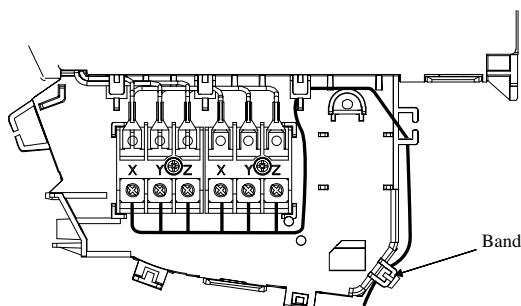


- Cut the jumper (printed "WIRED REMOCON") attached on the board.
- It is impossible to control by the wireless remote control after cutting the jumper.



- Install the upper box.

- (v) Connect the wire
 - Connect the wired remote control and super link wire.
 (Please refer to the installation manual of attachment in wired remote control for details)



- Each wire can be connected the left or right terminal block.

- (vi) Install the control box.
 - Be careful not to bite the wire.
- (vii) Install the front panel.
- (viii) Install the air inlet panel.

- Notes (1) One remote control cannot control two or more indoor units.
- (2) To connect the super link, the optional SC-AD-E (super link adapter) is required.

(b) Installation of wired remote control (Optional parts)

(i) Selection of installation location

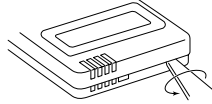
Avoid the following locations

- 1) Direct sunlight.
- 2) Close to heating device.
- 3) Highly humid or water splashing area.
- 4) Uneven surface.

(ii) Installation procedure

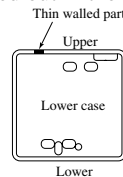
1) Exposed fitting

- a) Open the remote control case.

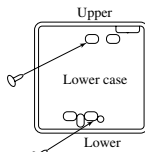


- Put a screw driver (flat-head) into the concavity made on the upper part of a remote control unit and twist it lightly to open the casing.

- b) The cord of a remote control unit can only be pulled out in the upward direction.

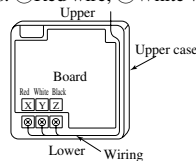


- Cut off with nippers or a knife a thin walled part made on the upper end of the remote control unit's bottom casing, and then remove burrs with a file or the like.
- c) Fix the remote control unit's bottom casing onto a wall with two wood screws supplied as accessories.



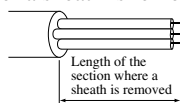
- d) Connect the remote control to the terminal block. Connect the terminals of the remote control to the indoor unit with the same numbers. Because the terminal block has polarity, the device becomes inoperative if there are wrong connections.

Terminals: (X) Red wire, (Y) White wire, (Z) Black wire



- Use a cord of 0.3mm² (recommended) - 0.5mm² (maximum) for a remote control unit cord. Remove a sheath of the remote control unit cord for the section laid within the remote control unit casing.

The length of each wire that should be left after a sheath is removed is as follows:



Black: 195mm, White: 205mm, Red: 215mm

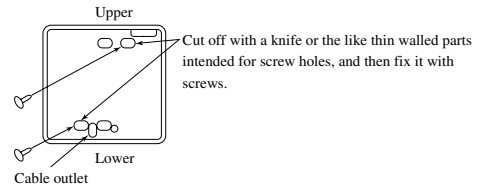
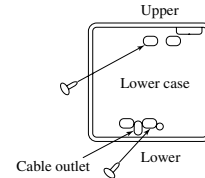
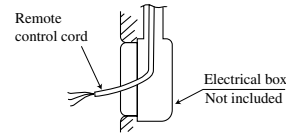
- e) Replace the top casing as before.

- f) Use a cord clamp to attach the remote control cord to the wall.

- g) Set the functions according to the types of indoor unit. See Section "Function Setting".

2) Recessed fitting

- a) The Electrical box and remote control (shield wire must be used in case of extension) are first embedded.



- b) Remove the upper case to the remote control.

- c) Attach the lower case to the Electrical box with two M4 screws. (Head diameter must be 8 mm). Choose either of the following two positions in fixing it with screws.

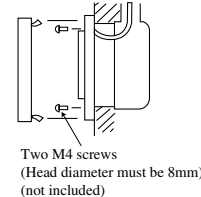
- d) Connect the remote cord to the remote control.

Refer to [Exposed Fitting].

- e) Installation work is completed by replacing the top casing onto the bottom casing as before.

- f) Set the function switch according to the type of the indoor unit.

Refer to [Function setting].



Precision in Extending the Remote control cord

- ▶ Maximum total extension 600m.

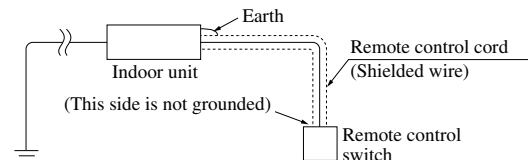
The cord should be a shielded wire.

- For all types : 0.3mm² × 3 cores

Note (1) Use cables up to 0.5mm² (maximum) for those laid inside the remote control unit casing and connect to a different size cable at a vicinity point outside the remote control unit, if necessary.

Within 100-200m.....	0.5 mm ² × 3 cores
Within 300m.....	0.75 mm ² × 3 cores
Within 400m.....	1.25 mm ² × 3 cores
Within 600m.....	2.0 mm ² × 3 cores

- The shielded wire should be grounded at one side only.



(c) Setting functions using the wired remote control

- (i) The default settings of this unit's functions are as follows: If you want to change a setting, follow the procedure found in the installation manual and set to your desired setting.

For the method of setting, please refer to the installation manual of a remote control unit.

① Remote control unit functions (FUNCTION ▼)

Function number (A)	Function description (B)	Setting (C)	Default setting
(01)	GRILLE ↑↓ SET (Grille lift panel setting)	↑↓ INVALID 50Hz AREA ONLY 60Hz AREA ONLY	○
02	AUTO RUN SET	AUTO RUN ON AUTO RUN OFF	○
03	☑/☒ TEMP S/W	☑/☒ VALID ☑/☒ INVALID	○
04	🔄 MODE S/W	🔄 VALID 🔄 INVALID	○
05	🔌 ON/OFF ON/OFF S/W	🔌 VALID 🔌 INVALID	○
06	⚙️ FANSPEED S/W	⚙️ VALID ⚙️ INVALID	○
07	🔧 LOUVER S/W	🔧 VALID 🔧 INVALID	○
08	⌚ TIMER S/W	⌚ VALID ⌚ INVALID	○
(09)	📡 SENSOR S/W (Remote control sensor setting)	📡 SENSOR OFF (Invalid) 📡 SENSOR ON (Valid)	○
10	POWER FAILURE COMPENSATION SET	INVALID VALID	○ *
(11)	VENTI SET	NO VENTI VENTI LINK SET NO VENTI LINK	○ ○ ○
12	TEMP RANGE SET	DISP CHANGE NO DISP CHANGE	○ ○
13	I/U FAN SPEED (Indoor unit fan speed setting)	3 FAN SPEED 2 FAN SPEED 1 FAN SPEED	○ ○ ○
14	MODEL TYPE	HEAT PUMP COOLING ONLY	○ ○
15	EXTERNAL CONTROL SET	INDIVIDUAL OPERATION SAME OPERATION FOR ALL UNITS	○ ○
16	ERROR DISP SET	ERROR DISP NO ERROR DISP	○ ○
17	🔧 POSITION (Louver control setting)	FIX (1 OF 4) (4 position stop) IN MOTION (Free stop)	○ ○
(18)	°C/°F SET	°C °F	○ ○

② Indoor unit functions (I/U FUNCTION ▲)

Function number (A)	Function description (B)	Setting (C)	Default setting
(01)	Hi CEILING SET	STANDARD (Mild mode) Hi CEILING 1 (Powerful mode)	*
(03)	FILTER SIGN SET	NO DISPLAY AFTER 180H AFTER 600H AFTER 1000H 1000H→STOP	*
04	🔧 POSITION (Louver control setting)	FIX (1 OF 4) (4 position stop) IN MOTION (Free stop)	○ ○
05	EXTERNAL INPUT SET	LEVEL INPUT PULSE INPUT	○ ○
06	OPERATION PERMISSION PROHIBITED	NORMAL OPERATION VALID	○ ○
(07)	☀️ ROOM TEMP OFFSET (Heating room temperature offset)	NORMAL OPERATION TEMP SHIFT +3°C	○ ○
(08)	☀️ FAN CONTROL (Heating fan control)	LOW FAN STOP→LOW FAN (Intermittent operation)	*
(09)	FREEZE PREVENT TEMP	TEMP Hi TEMP Lo	○ ○
(10)	FREEZE PREVENT CONTROL	FAN CONTROL ON FAN CONTROL OFF	○ ○

Notes(1) Setting marked with [○] are the default setting.

- (2) Setting marked with [*] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.

- (3) The SRK model cannot set the items described in () in the function number (A).

Notes(1) Setting marked with [○] are the default setting.

- (2) Setting marked with [*] are those that are set automatically according to an indoor unit or an outdoor unit connected. Please check default settings with the indoor unit's installation manual.

- (3) When Item 17 : 🔧 POSITION is changed, please also change Item 04 🔧 POSITION setting found in Indoor unit functions .

- (4) The SRK model cannot set the items described in () in the function number (A).

(ii) Function setting method

- 1) Stop the air conditioner
- 2) Press the SET and MODE buttons simultaneously for 3 seconds or longer.

The screen display will be switched as follows:

“ SELECT ITEM” →

“ SET” →

“FUNCTION SET ▼”



- 3) Press the SET button.

The unit will enter the function setting mode. The screen display will change to “ FUNCTION ▼”.

- 4) Check which category your desired setting belongs to, “ FUNCTION ▼ (Remote control unit function)” or “I/U FUNCTION ▲” (Indoor unit function).

- 5) Press either or button.

Select either “ FUNCTION ▼ ” or “I/U FUNCTION ▲”.



- 6) Press the SET button.

When “ FUNCTION ▼ ” is selected.

- ① “DATA LOADING” (blinking) → “ FUNCTION” →

“01 GRILLE ↑↓ SET” (Function number: ①, Function description: ②)

The screen display will be switched like this.

- ② Press either or button.

“Function number: ①, Function description: ②” from the list of remote control unit functions will be displayed one by one. Select a desired function.

- ③ Press the SET button.

The screen display will be switched as follows:

“ SETTING” → “Setting: ③” (ex. “AUTO RUN ON”)

- ④ Press either or button.

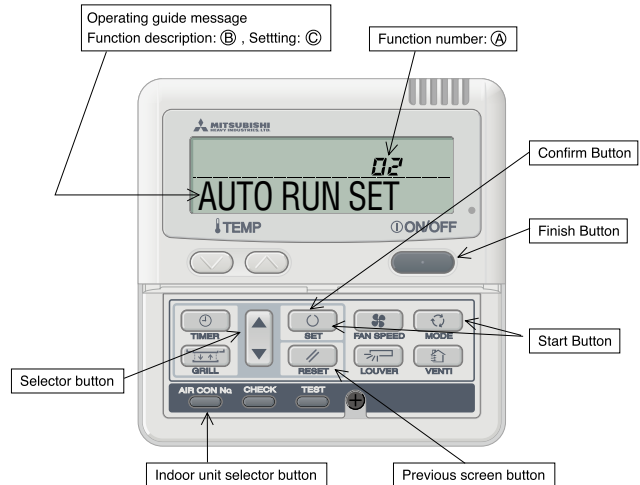
A list of “Settings: ③” will be displayed one by one. Select your desired setting.

- ⑤ Press the SET button.

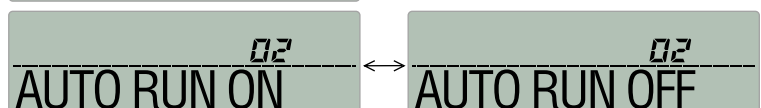
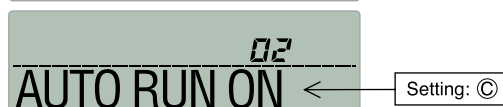
The selected setting is displayed for 2 seconds, then followed by “SET COMPLETE” and the function setting process is completed.

Then the screen display will be switched to “Function number: ①, Function description: ②,” so if you want to continue to set another function, repeat the steps as explained above.

To finish the function setting process, please proceed to Step (iii).



* When “02 AUTO RUN SET ” is selected.



When "I/U FUNCTION ▲" is selected.

- ① The screen display will be switched as follows:

"◆ I/U SELECT" → "○ SET" → "I/U No.00" (blinking)



- ② Press either ▲ or ▼ button.

Select the indoor unit number that you want to change settings. If only one indoor unit is connected, the indoor unit number will not change, so please proceed to Step ③.

If "ALL I/U ▼" is selected while indoor group control is in effect, you can set all units to the same settings.

- ③ Press the SET button.

Indoor unit number indication will change from blinking to lit continuously, The screen display will be switched as follows:

"DATA LOADING" (blinking for about 2 to 23 seconds) → "◆ FUNCTION" → "05 EXTERNAL INPUT SET" (Function number: ①, Function description: ②)

* When 05 EXTERNAL INPUT SET is selected.

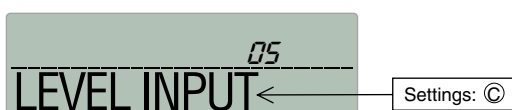


- ④ Press either ▲ or ▼ button.

"Function number: ①, Function description: ②" from the list of indoor unit functions will be displayed one by one. Select a desired function.

- ⑤ Press the SET button.

The screen display will be switched as follows: "◆ SETTING" → "Setting: ③" (ex. "LEVEL INPUT")



- ⑥ Press either ▲ or ▼ button.

A list "Setting: ③" will be displayed one by one. Select your desired setting.

- ⑦ Press the SET button.

The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.

Then the screen display will be switched to "Function number: ①, Function description: ②" so if you want to continue to set another function, repeat the steps as explained above. To finish the function setting process, please proceed to Step 8.

- ⑧ Press AIR CON No. button.

The screen display will go back to the indoor unit selection screen (ex. "I/U No.00").

- (iii) Press the ON/OFF button.

This ends a function setting process. Even if a function setting process is not completed, this ends the process.

Please note that any setting that is not completed will become void.

- **Pressing the RESET button during a function setting process will allow you to go back the previous step. Please note that any setting that is not completed will become void.**

- **Method of checking the current setting**

While following the above mentioned step, the setting that appears when the SET button is pressed for each "Function number: ①, Function description: ②" is the current setting "Setting: ③". (When "ALL I/U ▼" is selected, the setting of the indoor unit with the lowest number is displayed)

- **Settings are stored in the controller and not lost even a power outage occurs.**

(iv) Changing the remote control's temperature setting range

1) The temperature setting range of the remote controller can be changed.

Through remote controller button operations, the upper limit and lower limit set temperature values can be changed individually.

During heating operation, the changed upper limit value becomes valid and at times other than during heating operation, (during cooling, dehumidification, auto and fan operation), the changed lower limit value becomes valid.

Range of Possible Changes

Upper Limit Value: 22~30°C (valid during heating) Lower Limit Value: 18 ~ 26°C (valid at times other than during heating)

2) Operation

- a) With the remote controller in the stopped state, press the SET and MODE buttons simultaneously for 3 seconds or longer. The display will changed from “ SELECT ITEM” → “ SET” → “FUNCTION SET ▼ ”
 - b) Press the button once. The display will change to TEMP RANGE ▲ .
 - c) Press the SET button to enter the temperature range setting mode.
 - d) Using the or button, select “Hi LIMIT SET ▼ ” or “Lo LIMIT SET ▲ ,” the press the SET button.
 - e) If “Hi LIMIT SET” is selected,
 - ① The display changes from “ SET UP” → “Hi LIMIT 22°C ” (flashing).
 - ② Using the “ ” button, select the upper limit value. Display example: “Hi LIMIT 22°C ” (flashing)
 - ③ Press the SET button to fix the setting. Display example: “Hi LIMIT 22°C” (lighted up)
 - f) If “Lo LIMIT SET” is selected,
 - ① The display changes from “ SET UP” → “Lo LIMIT 26°C ” (flashing).
 - ② Using the “ ” button, select the upper limit value. Display example: “Lo LIMIT 26°C ” (flashing)
 - ③ Press the SET button to fix the setting. Display example: “Lo LIMIT 26°C” (lighted up)
 - g) Press the ON/OFF button to end the setting procedure.
(The procedure also ends if the ON/OFF button is pressed during the setting operation. However, settings which have not been fixed become invalid, so exercise caution.)
- If the RESET button is pressed during a setting operation, the display returns to the previously displayed setting screen. However, settings which have not been fixed become invalid, so exercise caution.
 - * If “NO DISP CHANGE” is selected in No. 12, “TEMP RANGE SET” of the remote control's functions, of the function setting modes, the remote control's display does not change even if the temperature range has been changed.

(Example) If the upper limit is set at 28°C

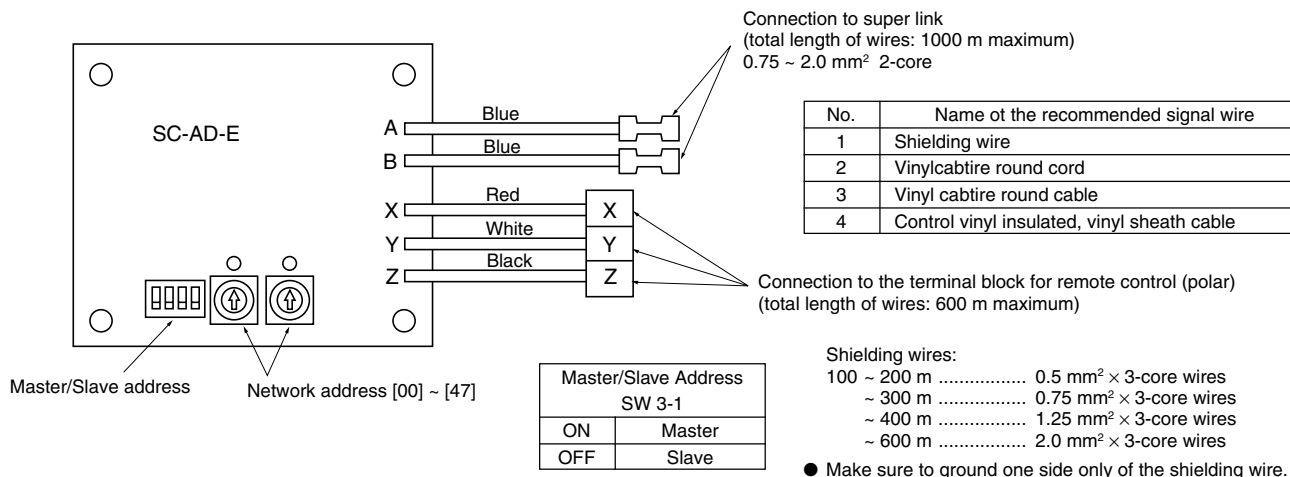
Function No. A	Function Contents B	Setting Contents C	Control Contents
12	TEMP RANGE SET	DISP CHANGE	The remote control's display and sent data upper limit changes to 28°C.
		NO DISP CHANGE	The remote control's display upper limit remains at 30°C and only the upper limit of the sent data is changed to 28°C.

(d) SUPER LINK ADAPTER (SC-AD-E)

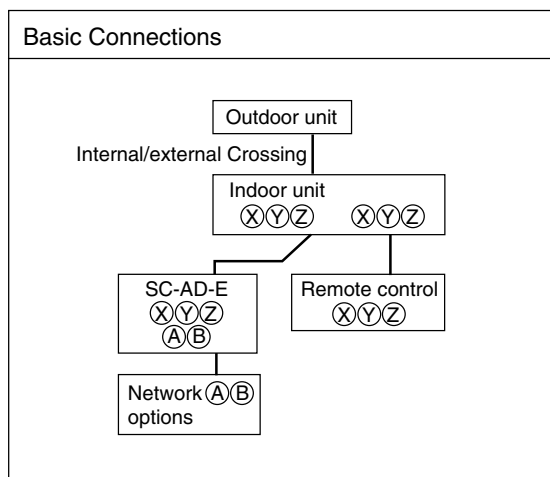
(i) Functions

- 1) Transmits the settings from the Super link option to the indoor units.
- 2) Returns the priority indoor unit data in response to a data request from the Super link option.
- 3) Inspects the error status of connected indoor units and transmits the inspection codes to the Super link option.
- 4) A maximum of 16 units can be controlled (if in the same operation mode).

(ii) Wiring connection diagram



- 1) Set the super link network address with SW1 (10-position) and SW2 (1-position).
- 2) Without a remote control (no wired remote control and no wireless remote control), set SC-AD-E SW3-1 to ON (Master).



2.3.6 MAINTENANCE DATA

(1) Troubleshooting procedures for electrical equipment

(a) Cautions

- ① If you are disassembling and checking an air conditioner, be sure to turn off the power before beginning. When working on indoor units, let the unit sit for about 1 minute after turning off the power before you begin work. When working on an outdoor unit, there may be an electrical charge applied to the main circuit (electrolytic condenser), so begin work only after discharging this electrical charge (to DC 10 V or lower).
- ② When taking out printed circuit boards, be sure to do so without exerting force on the circuit boards or package components.
- ③ When disconnecting and connecting connectors, take hold of the connector housing and do not pull on the lead wires.

(b) Items to check before troubleshooting

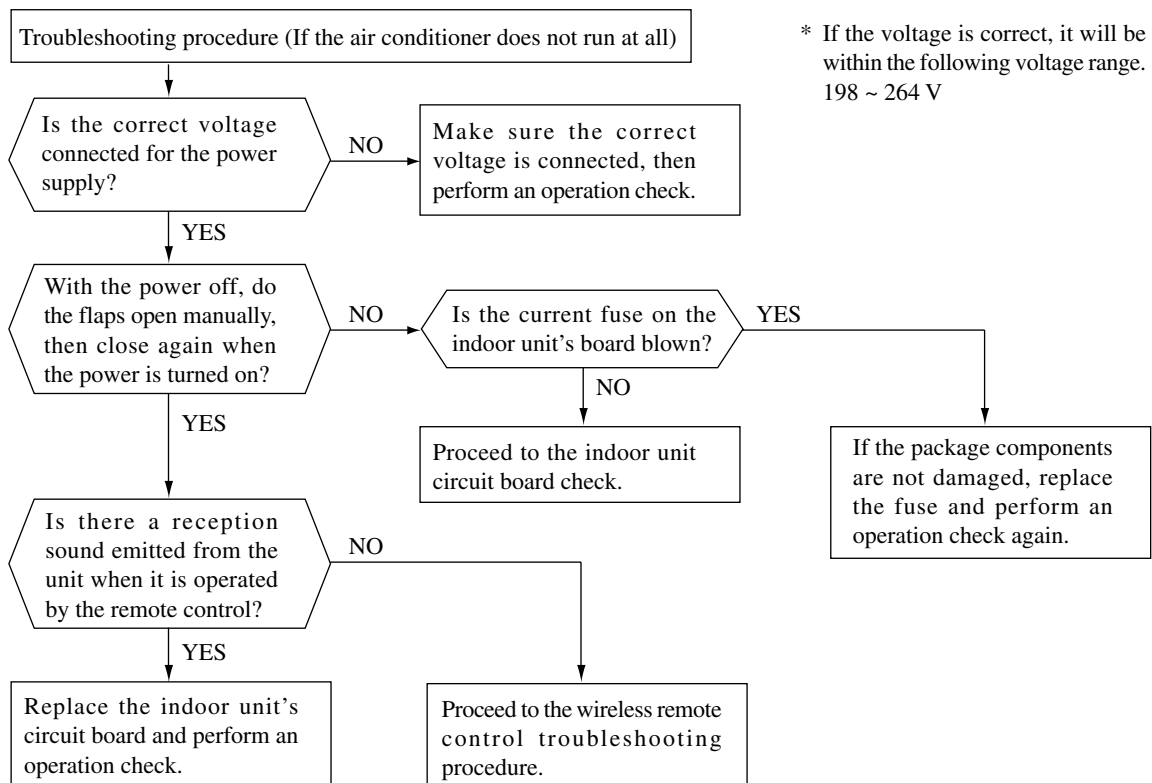
- ① Have you thoroughly investigated the details of the trouble which the customer is complaining about?
- ② Is the air conditioner running? Is it displaying any self-diagnosis information?
- ③ Is a power supply with the correct voltage connected?
- ④ Are the control lines connecting the indoor and outdoor units wired correctly and connected securely?
- ⑤ Is the outdoor unit's refrigerant service valve open?

(c) Troubleshooting procedure (If the air conditioner does not run at all)

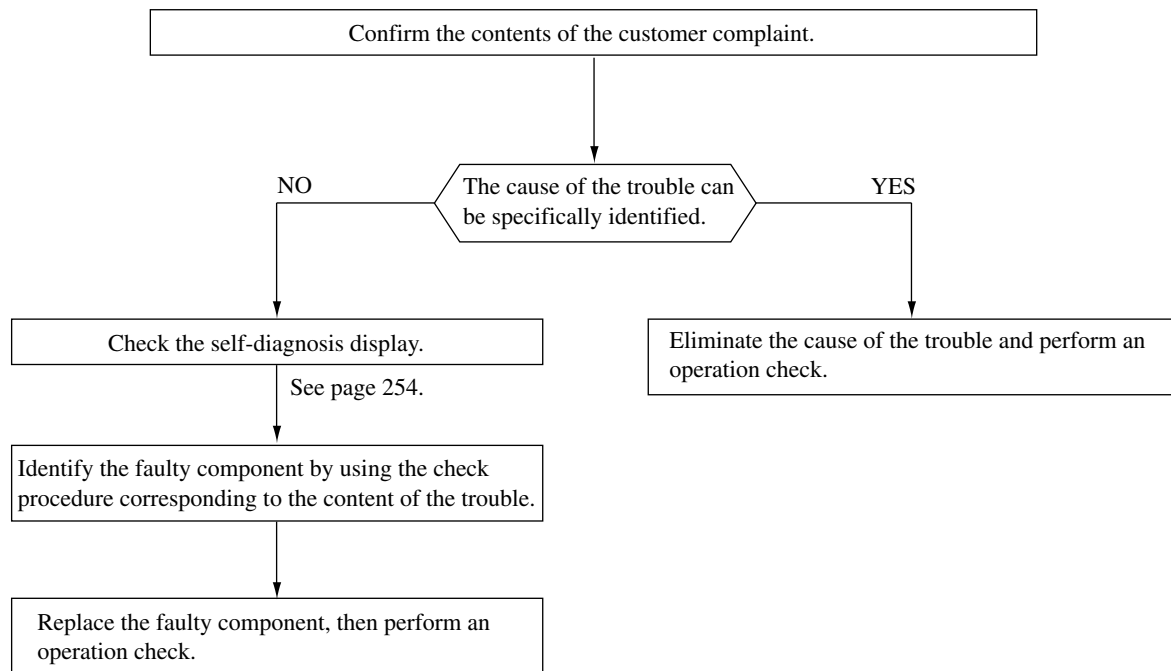
If the air conditioner does not run at all, diagnose the trouble using the following troubleshooting procedure. If the air conditioner is running but breaks down, proceed to troubleshooting step (d).

Important When all the following conditions are met, we say that the air conditioner will not run at all.

- ① The Run light does not light up.
- ② The flaps do not open.
- ③ The indoor unit fan motors do not run.
- ④ The self-diagnosis display does not function.



(d) Troubleshooting procedure (If the air conditioner runs)



Note (1) Even in cases where only intermittent stop data are generated, the air conditioning system is normal. However, if the same protective operation recurs repeatedly (3 or more times), it will lead to customer complaints. Judge the conditions in comparison with the contents of the complaints.

(e) Self-diagnosis table

When this air conditioner performs an emergency stop, the reason why the emergency stop occurred is displayed by the flashing of display lights. If the air conditioner is operated using the remote control 3 minutes or more after the emergency stop, the trouble display stops and the air conditioner resumes operation. ⁽¹⁾

Indoor unit display panel		Wired remote control display	Description of trouble	Cause	Display (flashing) condition
Run light	Timer light				
ON	6 time flash	E 5	Error of signal transmission	• Defective power supply, Broken signal wire, defective in/outdoor unit boards	When there is no signal between the indoor unit's board and outdoor unit's board for 10 seconds or longer (when the power is turned on), or when there is no signal for 1 minute 50 seconds or longer (during operation)(the compressor is stopped).
1 time flash	ON	E 6	Heat exchanger sensor error	• Broken heat exchanger sensor wire, poor connector connection	When a heat exchanger sensor wire disconnection is detected while operation is stopped. (If a temperature of -20°C or lower is detected for 3 minutes, it is judged that the wire is disconnected.) (Not displayed during operation.)
2 time flash	ON	E 7	Room temperature sensor error	• Broken room temperature sensor wire, poor connector connection	When a room temperature sensor wire disconnection is detected while operation is stopped. (If a temperature of -20°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
6 time flash	ON	E 16	Indoor fan motor error	• Defective fan motor, poor connector connection	When conditions for turning the indoor unit's fan motor on exist during air conditioner operation, an indoor unit fan motor speed of 300 rpm or lower is measured for 30 seconds or longer. (The air conditioner stops.)
ON	5 time flash	E 36	Over heat of compressor	• Gas shortage, defective discharge pipe sensor, closed service valve	When the value of the discharge pipe sensor exceeds the set value. (The air conditioner stops.)
Keeps flashing	2 time flash	E 37	Outdoor heat exchanger sensor error	• Broken heat exchanger sensor wire, poor connector connection	When a sensor wire disconnection is detected while operation is stopped. (If a temperature of -64°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
Keeps flashing	1 time flash	E 38	Outdoor air temperature sensor error	• Broken outdoor air temp. sensor wire, poor connector connection	When an outdoor air temperature sensor wire disconnection is detected while operation is stopped. (If a temperature of -64°C or lower is detected for 15 seconds, it is judged that the wire is disconnected.) (Not displayed during operation.)
Keeps flashing	4 time flash	E 39	Discharge pipe sensor error	• Broken discharge pipe sensor wire, poor connector connection	After the compressor has operated for 9 minutes continuously, if there is a disconnected signal for the discharge pipe temperature sensor detected -64°C for 15 seconds.
ON	2 time flash	E 59	Abnormality of outdoor unit	• Broken compressor wire • Broken discharge pipe sensor wire, poor connector connection • Compressor blockage	Cooling operation When the indoor heat exchanger temperature does not fall to 25°C or below for 40 minutes after 5 minutes have elapsed since the compressor operation start. Heating operation ① The indoor heat exchanger temperature < 5°C for 5 minutes and more ② 5°C ≤ the indoor heat exchanger temperature < 30°C for 40 minutes and more
—	—	E 1	Error of wired remote control wiring	• Broken wired remote control wire, defective in door unit boards	The wired remote control wire Y is open. The wired remote control wires X and Y are reversely connected. Noise is penetrating the wired remote control lines. The wired remote control or indoor control PCB is faulty. (The communications circuit is faulty.)

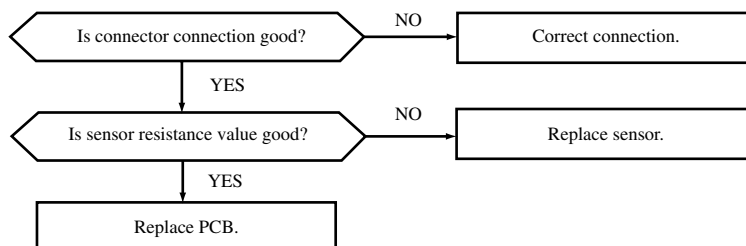
Notes (1) The air conditioner cannot be restarted using the remote controller for 3 minutes after operation stops.

(2) The wired remote control is optional parts.

(f) Inspection procedures corresponding to detail of trouble

Sensor error

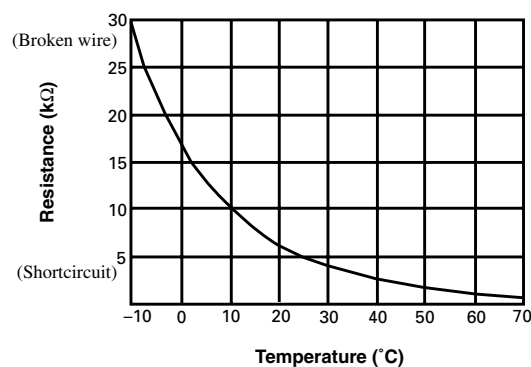
[Broken sensor wire, connector poor connection]



◆ Discharge pipe sensor temperature characteristics

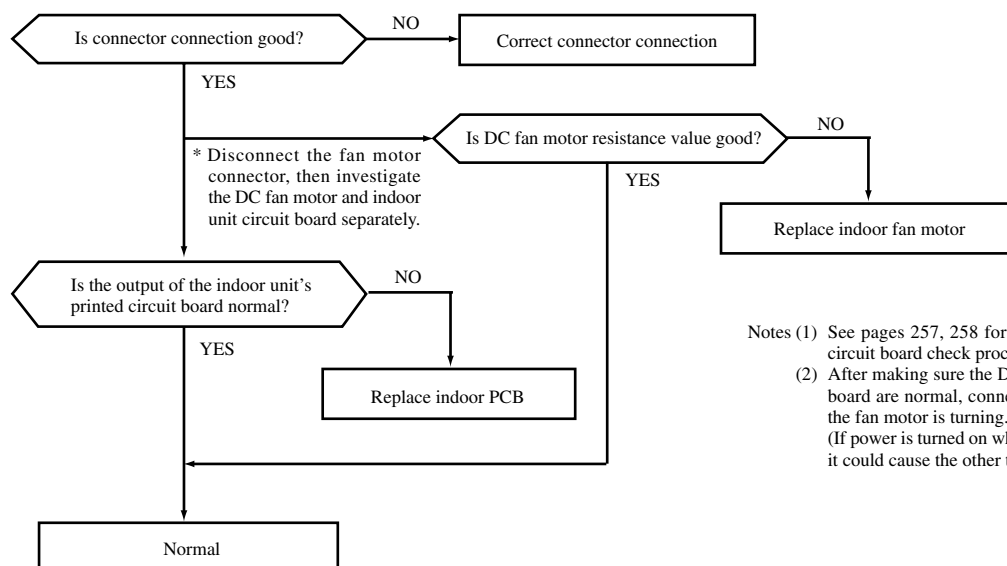
Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
0	164	70	8.7
5	127	75	7.3
10	99	80	6.2
15	78	85	5.3
20	62	90	4.5
25	50	95	3.9
30	40	100	3.3
35	32	105	2.9
40	26	110	2.5
45	21	115	2.2
50	17	120	1.9
55	14	125	1.6
60	12	130	1.4
65	10	135	1.3

◆ Sensor temperature characteristics (Room temp., indoor unit heat exchanger temp., outdoor unit heat exchanger temp., outdoor air temp.)



Indoor fan motor error

[Defective fan motor, connector poor connection, defective PCB]

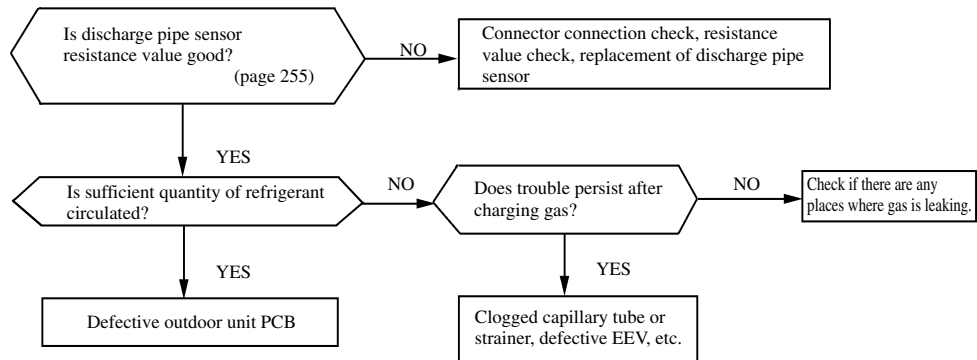


Notes (1) See pages 257, 258 for the DC fan motor and indoor unit circuit board check procedure.

(2) After making sure the DC fan motor and indoor unit circuit board are normal, connect the connectors and confirm that the fan motor is turning.
(If power is turned on while one or the other is broken down, it could cause the other to break down also.)

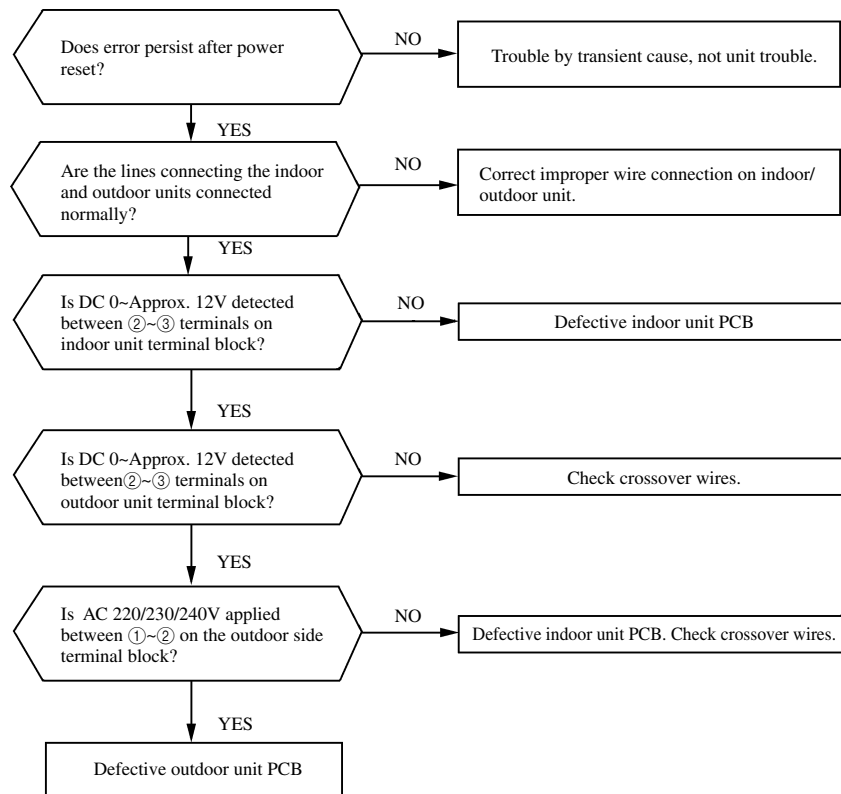
Over heat of compressor

[Gas shortage, defective discharge pipe sensor]



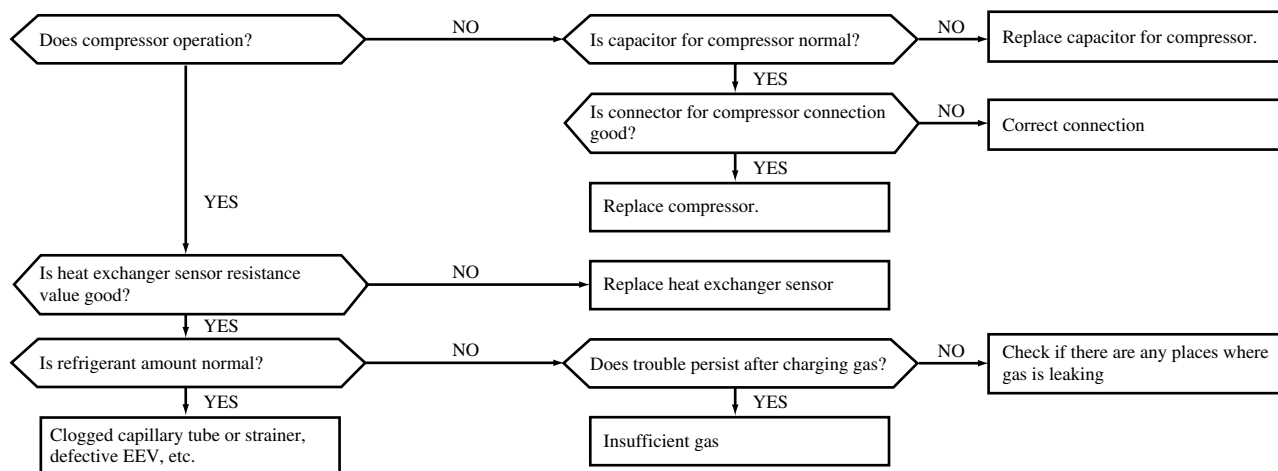
Error of signal transmission

[Wiring error including power cable, defective indoor/outdoor unit PCB]



Abnormality of outdoor unit

[Compressor malfunction of insufficient gas (refrigerant)]



(g) Phenomenon observed after shortcircuit, wire breakage on sensor.

(i) Indoor unit

Sensor	Operation mode	Phenomenon	
		Shortcircuit	Broken wire
Room temperature sensor	Cooling	Release of continuous compressor operation command	Continuous compressor operation command is not released.
	Heating	Continuous compressor operation command is not released.	Release of continuous compressor operation command
Heat exchanger sensor	Cooling	Compressor stop. (Abnormality of outdoor unit)	Continuous compressor operation command is not released. (Anti-frosting)
	Heating	High pressure control mode	Hot keep (Indoor fan stop)

(ii) Outdoor unit

Sensor	Operation mode	Phenomenon	
		Shortcircuit	Broken wire
Heat exchanger sensor	Cooling	System can be operated normally.	System can be operated normally.
	Heating	Defrosting is not performed.	Defrosting is performed for 10 minutes at approx. 35 minutes.
Outdoor air temperature sensor	Cooling	System can be operated normally.	System can be operated normally.
	Heating	Defrosting is not operated.	Defrosting is performed for 10 minutes at approx. 35 minutes.
Discharge pipe sensor	All modes	Compressor overload protection is disabled. (Can be operated.)	Compressor stop

(h) Checking the indoor electrical equipment

(i) Indoor unit circuit board check procedure

- Press the unit's ON/OFF button for 5 seconds or longer (a beep which indicates receiving will be emitted). Then check the following items.
 - The indoor unit's fan motor runs.
 - The run light lights up.
- There should be voltage (AC 220-240 V) between terminals ① and ② on the terminal block.
With the analog tester set in the DC 30 V range, if the voltage at ② (+) and ③ (-) is measured, the needle oscillates at about 12V.
- It is possible to run and stop the unit using the remote controller. (The hot keep function is activated.)
If operation is as described above, the indoor unit's board is normal.

Note (1) Check the voltage on the terminal block.

- Power supply : Between ①-② (AC 220-240V)
- Signal : Between ②-③ (Changing between DC 0-Approx. 12V)

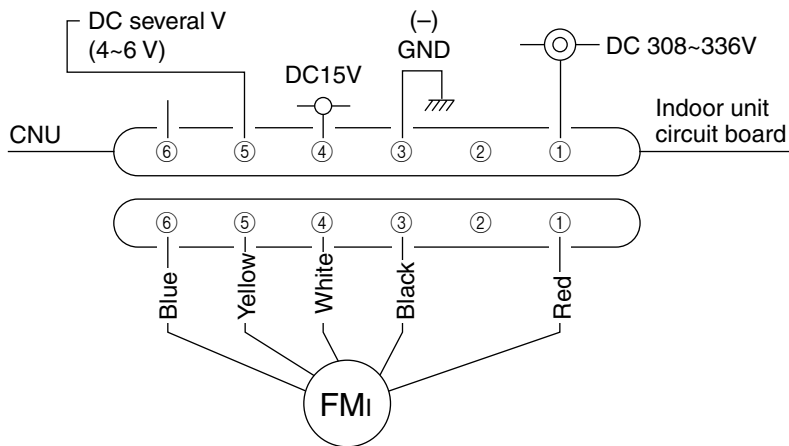
(ii) Indoor unit fan motor check procedure

This is a diagnostic procedure for determining if the indoor unit's fan motor or the circuit board is broken down.

1) Indoor unit printed circuit board output check

- Turn off the power.
- Remove the front panel, then disconnect the fan motor lead wire connector.
- Turn on the power. If the unit operates when the ON/OFF button is pressed, if trouble is detected after the voltages in the following figure are output for approximately 30 seconds, it means that the circuit board is normal and the fan motor is broken down.

If the voltages in the following figure are not output at connector pins No. ①, ④ and ⑤, the indoor unit's circuit board has failed and the fan motor is normal.



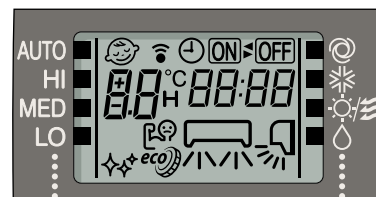
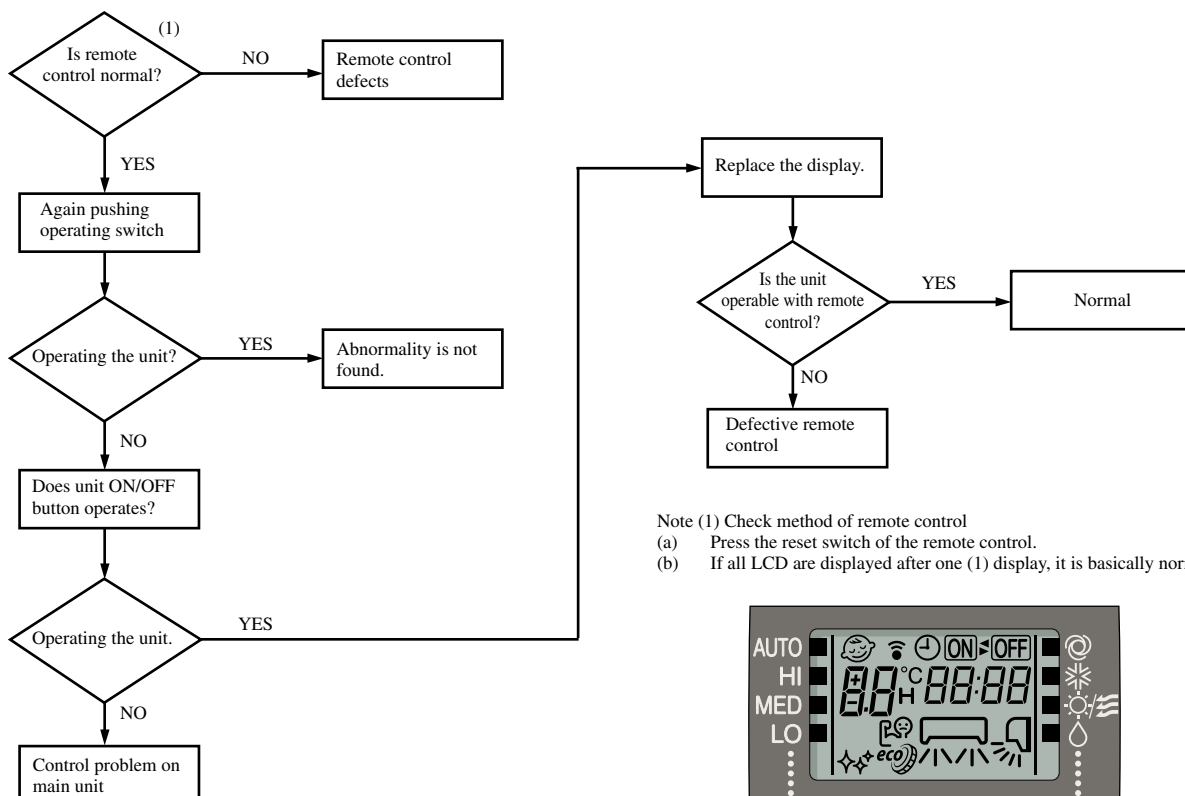
(ii) DC Fan motor resistance check

Measuring Point	Resistance when Normal
① - ③ (Red - Black)	25 MΩ or higher
④ - ③ (White - Black)	30 kΩ or higher

Notes (1) Remove the fan motor and measure it without power connected to it.

(2) If the measured value is below the value when the motor is normal, it means that the fan motor is faulty.

(i) How to make sure of remote control



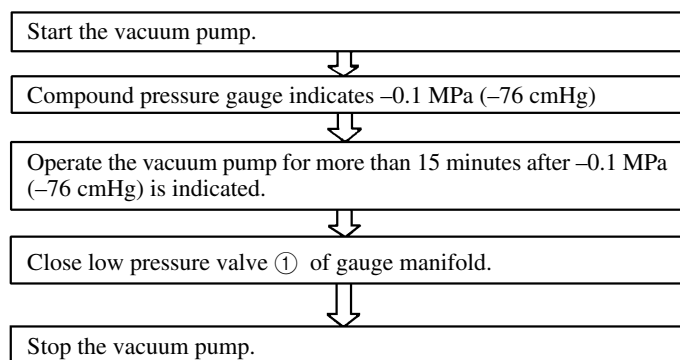
(2) Servicing

(a) Evacuation

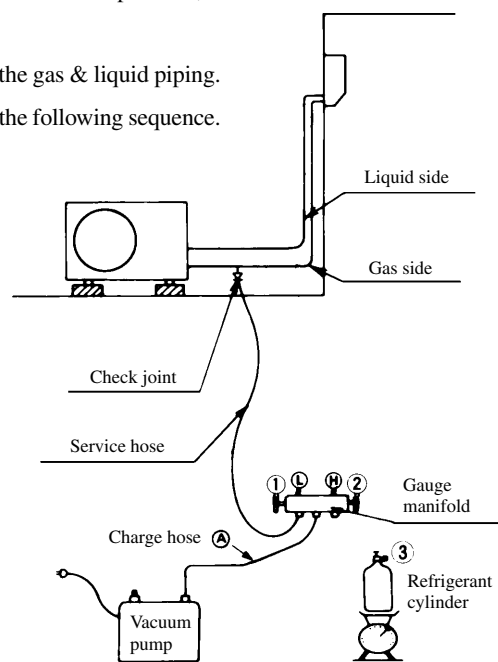
The evacuation is an procedure to purge impurities.....noncondensable gas, air, moisture from the refrigerant equipment by using a vacuum pump. Since the refrigerant R410A is very insoluble in water, even a small amount of moisture left in the refrigerant equipment will freeze, causing what is called water clogging.

- Evacuation procedure

- Check to ensure that there is no internal pressure in the unit. If there is an internal pressure, it should be relieved through the check joint.
- Connect the service hoses of the gauge manifold to the check joint of the gas & liquid piping.
- Connect a vacuum pump to the charge hose (A). Repeat evacuation in the following sequence.



- Notes
- (1) Do not use the refrigerant pressure to expel air.
 - (2) Do not use the compressor for evacuation.
 - (3) Do not operate the compressor in the vacuum condition.



(b) Refrigerant charge

- Discharge refrigerant entirely from the unit and evacuate the unit.
Note: Addition of refrigerant without evacuation is unreasonable, because it will result in low charge or overcharge.
- Keep the gauge manifold and connect a refrigerant cylinder to the unit.
- Record the weight of the refrigerant cylinder on the balance. This is necessary for making sure of the charged refrigerant amount.
- Purge air from the charge hose (A)
Firstly loose the connecting portion of the charge hose (A) at the gauge manifold side and open the valve (3) for a few seconds, and then immediately retighten it after observing that gas is blow out from the loosened portion.
- Open the valve (1) and (3) after discharging air from the charge hose (A), then the liquid refrigerant begins flowing from the cylinder into the unit. Be sure to erect the refrigerant cylinder upright to let liquid refrigerant flow into the unit.
- When refrigerant has been charged into the system to some extent, refrigerant flow becomes stagnant, when that happens, start the compressor in cooling cycle until the unit is filled with refrigerant to the specified weight.
- Making sure of the refrigerant amount, close the valve (3)
- Disconnect the charge hose from the unit. Cover the valve ports of the refrigerant piping with caps and tighten them securely.
- Check for gas leakage applying a gas leak detector along the piping line.
- Start the air conditioner and make sure of its operating condition.....high side and low side pressures and temperature difference between return air and supply air.

2.3.7 REFRIGERANT PIPING INSTALLATION/SERVICING MANUAL FOR AIR CONDITIONERS USING R410A

This is same as chapter 1.1.7. Refer to page 55.

[illegible]



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